

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

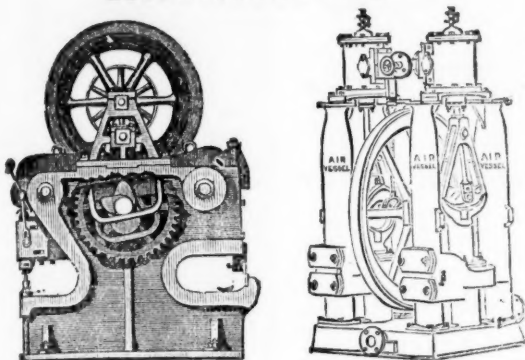
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LONDON, SATURDAY, JUNE 15, 1878.

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BAR SHEARS.**
ESTABLISHED 1852.



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cylinders, &c. 130
" No. VI. (must be cast in chill) for bolts, &c. 140
This alloy has very great tensile strength
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plungers, piston rings, bushes and bearings,
for steel shafts 140
" No. XI., special phosphor-bronze bearing metal,
wearing five times as long as gun metal 112

The prices of castings vary according to the pattern, the quantity required, and
the alloy used.

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steam joints and glands, possesses an unusual power of resisting
heat, works efficiently under the highest pressure of steam, being
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AND 10, MARSDEN STREET, MANCHESTER.



PARIS,
BRONZE MEDAL, 1867.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH,
SILVER MEDAL, 1867

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the
Geographical Congress, Paris, 1875—M. Favre, Contractor, having
exhibited the McKean Drill alone as the MODEL BORING MACHINE
for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland
Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecu-
tive weeks, ending February 7, was 24-90, 27-60, 24-80, 26-10,
28-30, 27-10, 28-40, 28-70 metres. Total advance of south head-
ing during January was 121-30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tun-
nel, the McKean Rock Drill continued to work until the pres-
sure was reduced to one-half atmosphere (7½ lbs.), showing
almost the entire motive force to be available for the blow
against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these
Machines for the SEVERN TUNNEL; the LONDON AND
NORTH-WESTERN RAILWAY for the FESTINIOG TUN-
NEL; and the BRITISH GOVERNMENT for several Public
Works. A considerable number of Mining Companies are now
using them. Shafts and Galleries are driven at from three to
six times the speed of hand labour, according to the size and
number of machines employed, and with important saving in
cost. The ratio of advantage over hand labour is greatest
where the rock is hardest.

These Machines possess many advantages, which give them
a value unapproached by any other system of Boring Machine.

THE MCKEAN ROCK DRILL IS ATTAINING GENERAL
USE THROUGHOUT THE WORLD FOR MINING, TUN-
NELLING, QUARRYING, AND SUB-MARINE BORING.

The MCKEAN ROCK DRILLS are the most powerful—the
most portable—the most durable—the most compact—of the
best mechanical device. They contain the fewest parts—have
no weak parts—act without SHOCK upon any of the operat-
ing parts—work with a lower pressure than any other Rock
Drill—may be worked at a higher pressure than any other
—may be run with safety to FIFTEEN HUNDRED STROKES
PER MINUTE—do not require a mechanic to work them—are
the smallest, shortest, and lightest of all machines—will give
the longest feed without change of tool—work with long or
short stroke at pleasure of operator.

The SAME Machine may be used for sinking, drifting, or
open work. Their working parts are best protected against
grit and accidents. The various methods of mounting them
are the most efficient.

N.B.—Correspondents should state particulars as to
character of work in hand in writing us for information,
on receipt of which a special definite answer, with
reference to our full illustrated catalogue, will be sent.

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IMPORTANT NOTICE TO MINE PROPRIETORS.

MR. GEORGE GREEN, ENGINEER, ABERYSTWITH,
SUPPLIES MACHINES under the above Company's Patents for
DRESSING all METALLIC ORES. Dressing-floors having these Machines pos-
sess the following advantages:—

- 1.—THEY ARE CHEAPER THAN ANY OTHER KIND IN FIRST OUTLAY.
- 2.—ONLY ABOUT ONE-FOURTH OF THE SPACE USUALLY OCCUPIED
BY DRESSING-FLOORS IS REQUIRED.
- 3.—FROM 60 TO 70 PER CENT. OF THE LABOUR IN DRESSING, AND
FROM 5 TO 10 PER CENT. OF ORE OTHERWISE LOST, IS SAVED.
- 4.—THEY ARE THE ONLY MACHINES THAT MAKE THE ORE CLEAN
FOR MARKET AT ONE OPERATION.

They have been supplied to some of the principal mines in the United Kingdom
and abroad—viz.,

The Greenside Mines, Patterdale, Cumberland; London Lead Company's Mines,
Darlington, Colberry, Nanthead, and Bollyhope; the Stonecroft and Greyeld
Mines, Hexham, Northumberland; Wanlockhead Mines, Abington, Scotland (the
Duke of Buccleuch's); Bewick Partners, Haydon Bridge; the Old Darren, Esclair-
mwyn, and Ystumtuen Mines, in Cardiganshire; Mr. Beaumont's W. B. Mines,
Darlington; also Mr. Sewell, for Argenteous Copper Mines, Peru; the Brate-
berg Copper Mines, Norway, and Mines in Italy, Germany, United States of
America, and Australia, from all of whom certificates of the complete efficiency of
the system can be had.

WASTE HEAPS, consisting of refuse chads and skippings of a
former washing, containing a mixture of lead, blende, and sulphur,
DRESSED TO A PROFIT.

Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleton-
in-Teesdale, by Darlington, writing on the 20th March, 1876, says—"The yearly
profit on our Nanthead waste heaps amounted last year to £800, besides the ma-
chinery being occupied for some months in dressing ore-stuff from the mines. Of
course, if it had been wholly engaged in dressing wastes our returns would have
been greater; but it is giving us every satisfaction, and bringing the waste heaps
into profitable use, which would otherwise remain dormant."

Mr. T. B. STEWART, Manager of the Duke of Buccleuch's Mines,
Wanlockhead, Abington, N. B., writing on 20th March, 1876, says—"I have much
pleasure in stating that a full and superior set of your Ore Dressing Machinery has
been at work at these mines for fully a month, and each day as the moving parts
become smoother, and those in charge understand the working of the machinery
better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply,
and satisfactorily than by any other method."

Mr. BAINBRIDGE, speaking of machinery supplied Colberry Mines,
says—"Your machinery saves fully one-half on old wages, and vastly more on the
wages we have now to pay. Over and above the saving in cost is the saving in ore,
which is a much short of 10 per cent."

GREENSIDE MINE COMPANY, Patterdale, near Penrith, say—"The
separation which they make is complete."

Mr. MONTAGUE BEALE says—"It will separate ore, however close
the mechanical mixture, in such a way as no other machine can do."

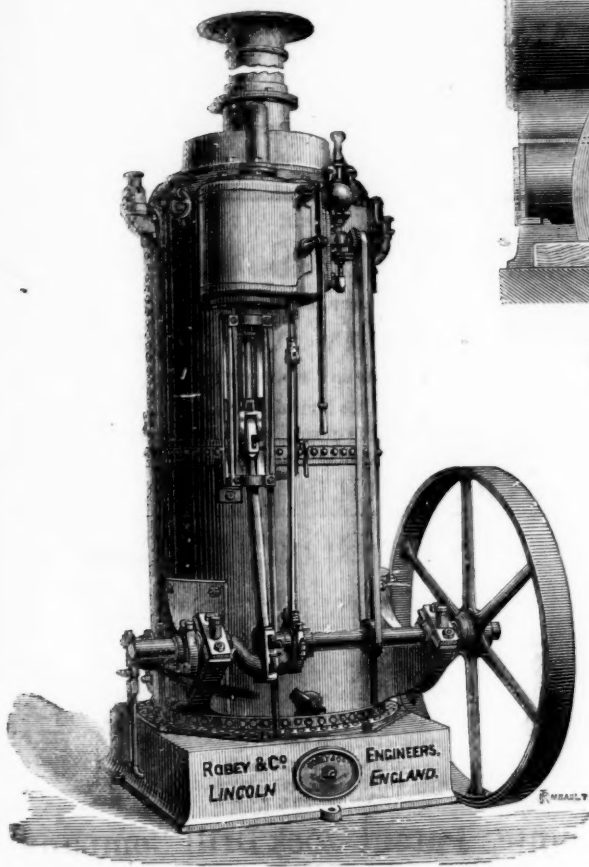
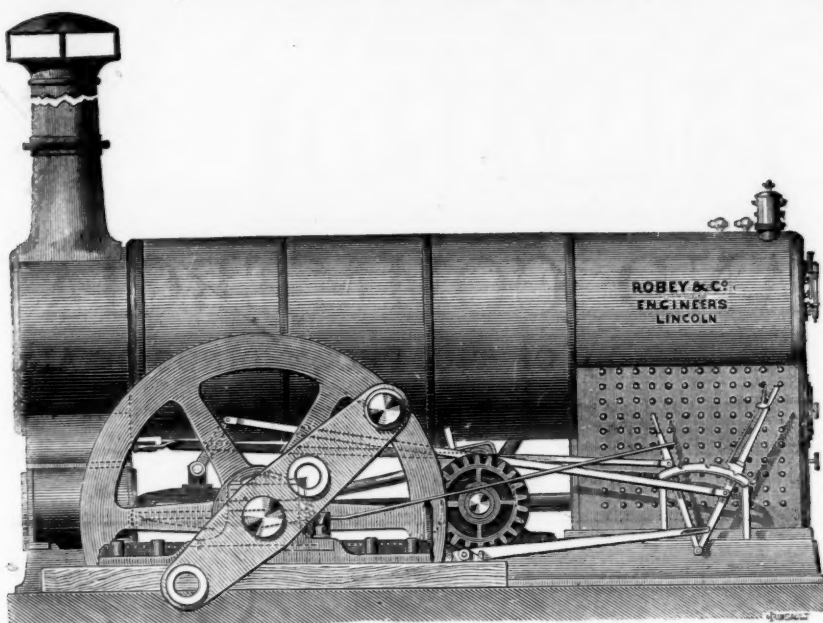
Mr. C. DODSWORTH says—"It is the very best for the purpose,
and will do for any kind of metallic ores—the very thing so long needed for dress-
ing-floors."

Drawings, specifications, and estimates will be forwarded on application to—
GEORGE GREEN, M.E., ABERYSTWITH, SOUTH WALES.

ROBEY & CO., ENGINEERS, LINCOLN.

No Expensive
Buildings, or
High Chimney
required.

Engines up to
200 effective
horse-power
always in
progress.



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The Patent Improved Robey Mining Engine.

Some of the advantages of this Engine are—

SMALL FIRST COST; SAVING OF TIME AND EXPENSE IN FIXING; EASE,
SAFETY, AND ECONOMY IN WORKING; GREAT SAVING IN FUEL.

LIKewise,

SOLE MANUFACTURERS OF

Improved Vertical Steam Engines and Patent Boilers combined.

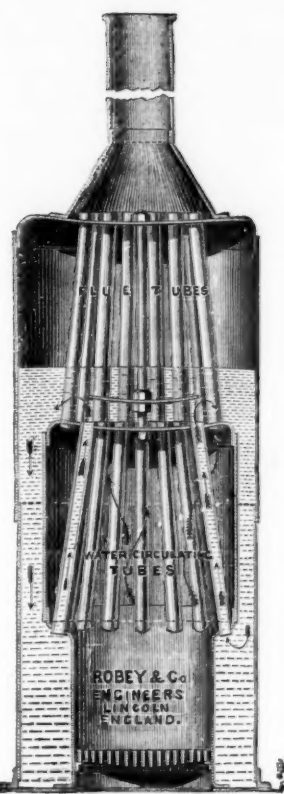
The Illustrations show one of Robey and Co.'s Improved Vertical Engines. All these Engines are supplied with R. and Co.'s New Patent Boiler, as per section illustrated, which has, among others, the following advantages over all Vertical Boilers yet introduced:—

PERFECT CIRCULATION OF THE WATER; SEPARATION OF THE SEDIMENT;
GREAT DURABILITY; GREAT ECONOMY IN FUEL.

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ROBEY & CO., LINCOLN, ENGLAND.



MECHANICAL VENTILATION OF MINES.

THE UNION ENGINEERING COMPANY (C. SCHIELE AND CO.) undertake the Construction and Erection of their Colliery Ventilation Fans, of all sizes up to the largest required quantities of air. The leading features of their system are now generally known. Some of the specialities are: The absence of necessity for costly erections in masonry and brickwork: the small space required for the Machines, and the moderate first cost of the whole.

As the Fans are in a great measure self-contained, the necessary seats and connection with Pit are of a simple and inexpensive character. They can be arranged to be placed below ground when required, and also to work on

Drawing Shafts. Certain sizes are often used to assist in Furnaces, with good effect.

[Estimates and further information will be prepared on receipt of the necessary particulars].

FOR SINKING PURPOSES, and also for places where small quantities of air are needed for Ventilating purposes, a Special Fan is made, in various sizes, with small engine combined, complete, arranged for both forcing and exhausting air.

NOISELESS BLOWING FANS, for Smithy Fires, and other purposes.

TURBINE WATER-WHEELS, specially designed and adapted for use in Coal Mines, for high falls of water, for the purpose of developing water power, where it is available, for use in hauling, pumping, and other works.

The Firm, having had an experience of nearly twenty-five years exclusively in the above Special Departments of Engineering, are prepared to advise on any matter affecting the application of Fans or Water Power in Collieries or elsewhere.

COAL-CUTTING MACHINERY, WINDING, HAULING, AND OTHER DESCRIPTIONS OF STEAM-ENGINES.

THE UNION ENGINEERING COMPANY (C. SCHIELE & CO.),
PNEUMATIC AND HYDRAULIC ENGINEERS,

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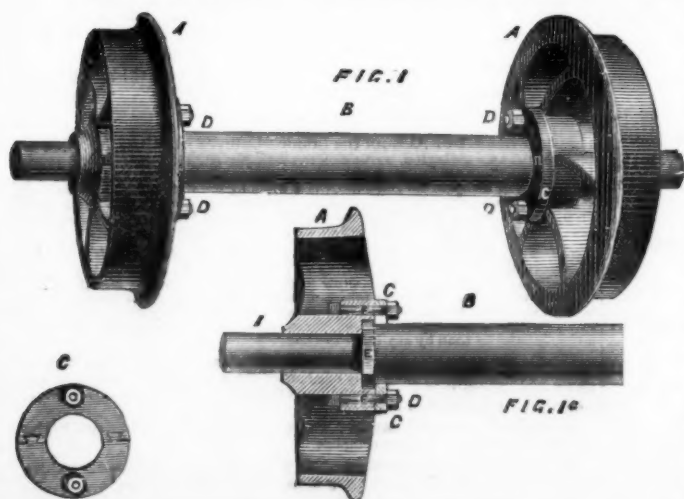
MANUFACTURERS OF

CAST STEEL AND FILES,
AND

CRUCIBLE CAST STEEL CASTINGS,

Sykes Works, Eyre-st. & Bridge-st., Sheffield. London Office: 118, Cannon-st., E.C.

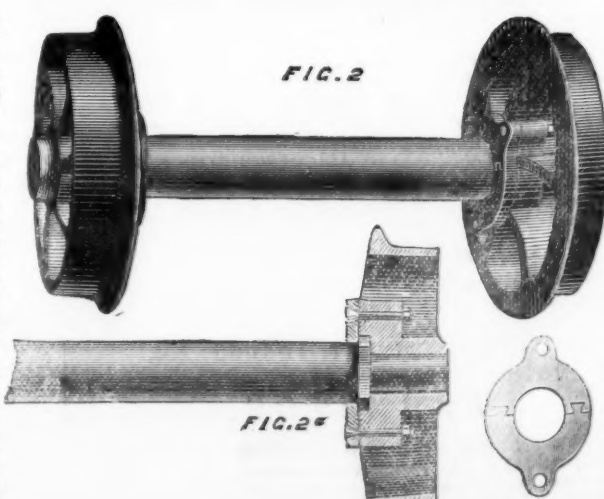
A New Patent Method of Fitting up Wheels and Axles.



Figs. 1 and 1a show a longitudinal view and plan of a pair of corf wheels and axles fitted up for outside bearings, and Figs. 2 and 2a for inside bearings. A A, are the wheels; B, is the axle; C C, the washers; D D, the bolts; E, the collar on axle B; and F, the recessed boss in the wheel.

The wheel is cast with a recessed boss in the inside, made to any shape, corresponding in shape and depth with a collar formed on the axle, which is forged of solid steel; the axle is secured into the recess partly by being sufficiently tightly fitted to require driving home with a hammer, and partly by the washer. Around the axle adjoining the boss is fixed the washer, made in two parts and dovetailed, so as to allow of being fixed after the collar has been forged on the axle. The washer is secured to the boss by bolts and nuts, both in outside and inside bearings; in the case of inside, by means of lugs cast on the boss, and the washer made of corresponding shape; the washer is made of crucible cast steel. The only tool required for fitting is an ordinary spanner for outside bearings, and a box spanner for inside bearings.

Now what are the advantages of this method? You secure a simple way of fitting—it can be done by anyone who has seen it—the only tool required being a spanner; the wheels can be detached from or secured to the axle in a few minutes. The next



advantage is the perfect solidity attained, the wheel and axle practically becoming as one piece. The durability results from the toughness of the material, and the solidity secured in the fitting. Another thing is the wheels do not need to be put in the fire to detach them, as is the case in ordinary wheels. (N.B.—Our wheels cannot be injured by being heated and plunged into cold water, which would render other steel wheels perfectly brittle as glass.) Saving in fuel and wages is evident—no skilled labour being required to refit wheels in case of a strained axle. By adopting this system colliery owners may save hundreds of pounds sterling yearly.

Original Correspondence.

COLLIERY EXPLOSIONS.

SIR.—Some months ago you did me the favour of inserting a letter on the many and varied ways in which these terrible calamities may arise. During the last six months a vast amount of information has been collected and put into form; many letters have been written and able lectures given all tending to a better understanding of this difficult and exceedingly complicated question. There is, however, one point apparently unnoticed hitherto—the nature of the oil used in the safety lamps. Some of our collieries use animal oils, some vegetable oils, and other mineral. It is a well-known fact that a Royal Commission in Belgium has prohibited the use of animal and mineral oils, and that vegetable oils only are permitted. No doubt there is some reason for their having done so. What is that reason?

It is an interesting question, what oils were used at the time of the explosions in the mines of Randleton and Blantyre when 250 lives were lost eight months ago, and what oil in the mine near Warrington just exploded? Is mineral or animal, then there are grounds for enquiry in favour of vegetable oil. According to my own experiments vegetable oils give a flame of comparatively low temperature that in itself tends to safety.

I am certain a safety lamp can be made that shall give a light superior to a naked light, and therefore induce the men to keep their lamps closed; but it will cost, say 15s., as against half that sum, while all colliery expenses are being cut down to the very last halfpenny. Of course, every light, be it lamp or candle, is a centre of danger; therefore the fewer the better. In Belgium fixed lights in charge of a responsible person are used where practicable, thus lessening danger, for the hand lamps are liable to be dropped or swung, thus risking explosion when gas is present, for a stationary lamp would be safe when the movement of a lamp would fire the mine. Immunity from explosions in mines never will be arrived at, but careful attention to minute details will lessen the number of them; and if vegetable oils are safer than other oils, as say the Belgians, then they only ought to be used. J. D. SHAKESPEAR.

June 8.

AN EXAMINATION INTO THE POSITION AND PROSPECTS OF CERTAIN MINES—No. VIII.—RICHMOND.

SIR.—Since the date of my last letter the directors' report of this company has been issued. Messrs. Bayliss and Stewart, two of the members of the committee, have also addressed a letter to the shareholders. The committee recommend in their report, with the object of putting an end to long and tedious speeches, that whatever information the directors might have to convey to the shareholders should be printed in pamphlet form. This recommendation does not appear to have been digested by the directors, or they may, perhaps, disdain to listen to it. The meetings, however, now called are of a somewhat special character. The ordinary meeting will be one of unusual interest, as a balance-sheet without its equal in the history of the mine will be presented. The extraordinary meeting to receive the committee's report will not be one of the smoothest that has been held, judging from Messrs. Bayliss and Stewart's letter. It is not surprising that the directors have not adopted the pamphlet form of report, as they may think that for the present the shareholders have had as much as they can be reasonably expected to read. Doubtless had the pamphlet been adopted this year it would have looked a small and insignificant production beside the committee's report.

The accounts issued are for ten months ending February 28, 1878. The smelting and refinery works were shut down for four months of the period, dead work only being carried on, so that the actual profitable working time is only six months. The accuracy with which the dead work is set down is surprising when it is remembered that there was "only a memorandum book purporting to show the cost of dead work, but the entries were found to be based more on estimates than on absolute disbursements." The results of the year are truly wonderful, the profit being for that time about 168,000. No other mining company has ever accomplished so much, and the shareholders have cause to be proud of it. The last two months of the year as estimated show a profit of about 1000. per day. As the accounts are made up to the end of February—that is, for ten months only—the net profit is 105,310. 4s. 10d. After paying 40,499. 2s. in dividends, 19,872. 10s. 2d. in lawsuits, and 932. 10s. in capital account, the balance, together with that of 33,466. 19s. 6d. brought forward from last year, amounts to 77,472. 19s. 2d. A further dividend was paid in May, so that the balance now in hand on the ten months working is 57,222. 19s. 2d. This success has been achieved through the increased richness of the ore, and the reduction in the working expenses. The committee have no doubt done much in bringing about so great a success. If so much has been done by the mere fact of its existence what might have been expected if the energy which it represents had been possessed of the full powers of management. The very efforts put forward by the managing director to do his best, as there is no doubt he has done of late, condemn in themselves the entire control of the company. There is proof supplied in the reduced working expenses that they could have been reduced before; there is also proof that if the directors had exercised their power they would have been reduced.

The development of the mine appears to be progressing favourably, although the ore has fallen off considerably in value, being something like \$20 per ton poorer than a short time ago. Whether this is temporary or not is impossible to say, but considering that the value of the ore rose gradually to the highest, and is now declining, it would seem that the richest part of the body being worked has been cut away, and the outside and poorer portion of it is being again reached.

There are three party spirits existent in this company. They may be thus named—the Director, the Cuthbert-Pulbrook, and last, though by no means least, the Directors' Committee. The two last parties coalesce in their strictures on the past management and recommendations for future operations. The disqualification question is strictly between the directors and Messrs. Cuthbert and Pulbrook, and has really nothing to do with the all important one of managing the mine and working efficiently. The shareholders have really no one to thank but those in power for the present state of affairs. Nothing can be more injurious to a successful enterprise than a divided spirit amongst its shareholders. There has surely been enough trouble from without, as well as from internal sources without an increase of it, which can only prove to be a burden and an annoyance to the shareholders, and ought not to be imposed on them to serve a party purpose. I am speaking now of the disqualification of Mr. Pulbrook. A little calm reflection on the part of the directors would show them that the shareholders of this company have passed through most trying and vexatious times, which might have been averted by the exercise of judicious local management and tact. And now this anxiety of the shareholders is to be increased, which for them has a purposeless object, because, as a matter of fact, it matters not really to the shareholders who serve as directors so long as they are responsible holders, and the duties involved in the directorship are discharged faithfully. The directors do not appear to think so, for they personally have shown a determination to keep Mr. Pulbrook out of the office to which he was elected in August last by the shareholders.

By an error a transfer deed from Mr. Pulbrook to Mr. Cuthbert for 100 shares was sent into the office for registration, and was in due form entered on the books of the company. The qualification of Mr. Pulbrook necessarily became cancelled, but the act of registration was shown to be an error on the part of Mr. Cuthbert's agent, and Mr. Pulbrook accordingly obtained an order from the Common Law Judge's Chambers to "rectify this error by striking out the name of William Cuthbert as the transferee of 100 shares from Anthony Pulbrook." Such an order restored Mr. Pulbrook to the directorial position conferred on him, but the directors have been "advised by counsel to appeal to rescind the order." It is clear, then, that Mr. Pulbrook was an objectionable element on the board, and the directors appear to have made the utmost effort to

keep him out of the position which the Court has really decided is his. It is well known that he is as much acquainted with the affairs of the company as any other member of the board, and his five weeks visit to the mines as a committeeman gave him unusual opportunities of making observations and of gaining information most valuable, and which would the more fit him for the office he held—that of director. These advantages are for the moment lost, but the shareholders will, no doubt, confirm his election. I am of the opinion that if the shareholders had been asked candidly, and in an unbiased manner, if it were their wish that the appeal should be made they would have answered, "No." If the directors had been desirous of seeing Mr. Pulbrook continue his good offices to the company, and there were technical or real objections surrounding his peculiar case, and the directors felt they were only conscientiously discharging their duties in enforcing them, could the difficulties not have been overcome by sending a properly worded proxy to the shareholders for signature to meet them?

But then, of course, the directors have had the fact revealed that the shares have been sold, although, so far as the striking out of the transferee's name for the 100 shares would not show it. Until proof is adduced that no contract or money has passed between the transferee and the transferor the sale must be considered to have practically taken place, and it would be a difficult matter in the face of the document in the company's hands, which has a consideration on the face of it of 7000. to disprove the sale. Until these identical shares are re-sold to Mr. Pulbrook the possibility is that he cannot have a legal right, resting in these shares, to sit on the board. If the shares have really been sold, and a duly executed deed of the sale is known to exist, Mr. Pulbrook, though appearing on the books, may not be considered a responsible shareholder; so the directors, after all, may prove to be legally in the right in opposing him. I have gone out of my course in discussing this matter, but it forms a large part of the directors' report, and is, therefore, one of much interest to the shareholders, most of whom are, doubtless, readers of your valuable Journal.

From the letter of Mr. John Bayliss it is evident that the committee mean business; their mainly and straightforward conduct ought to be supported by everyone who has the true interests of Richmond at heart. The committee have sacrificed much in doing their work, and the "two or three recommendations" of the committee to which the directors object may be most vital ones. One thing now is clear, the directors are opposed to the committee. It seems as though the directors have a fear of meeting the committee on fair grounds. If the directors think there is any danger in carrying out the committee's suggestions it ought to be known what it is; delay is dangerous. The danger they may fear will not decrease but increase. It may be naturally expected that there will be a great deal said in defence of the management. We may, perhaps, hear that the mine has been managed as well as any other mine. Certainly the results have been good no one will deny, although they fall short 5 per cent. per annum of the 18 per cent. per annum held out in the prospectus. It must not be forgotten that it is a mine unsurpassed for richness and resource by any owned by English companies. Given the same concern under able and economical management and the results would not have been 13 per cent. per annum profits but 28 per cent., taking the committee's report as the criterion for this estimate. Delinquencies of the past management ought not to be passed over, but met in the spirit they deserve. Pass them over, and say let "bygones be bygones," you have no guarantee that the evils of management will cease; there is but one remedy—pluck them out by the roots.

S, Drapers' Gardens, E.C., June 12.

WILLIAM GABBOTT.

Stock and Share Dealer.

RICHMOND MINE.

SIR.—Thanks to the evidence promulgated by the Committee, it has come to light that though Mr. Probert was aware that Messrs. Clarence King, Price, McGee, and other scientific men had advised that the ground on the 200 ft. level should be prospected, yet when he (Mr. Probert) was appointed managing director in December, 1875, he caused all the explorations in which Mr. Rickard had been so skillfully and pertinaciously engaged during the year to cease, and it was not until the shareholders took matters into their own hands at the general meeting in August, 1877, and appointed a committee to go and visit the mine, that Mr. Rickard was allowed to continue the explorations towards the quartzite, and which have given the magnificent returns alluded to in the report just issued. It is my firm opinion that had it not been for the action of the shareholders in the appointment of the Committee we should have drifted into impecuniosity, and then the mine would have slipped through our fingers into the hands of parties who knew its value.

It is not necessary for the shareholders to discuss at the meeting, to be held on Tuesday, whether Mr. Probert is a chemist a mineralogist, or metallurgist. Firstly, let us ask ourselves have we confidence in our managing director? I unhesitatingly say that I have no confidence. Let that be the first question put to the meeting, and having answered that in the negative we will call upon the board to resign. We can then proceed to elect a new board, inviting any of those whose services we wish to retain to take seats thereon. It behoves every shareholder who wishes to form an opinion for himself to read attentively the Committee's exhaustive report, otherwise let him kindly send his proxy to the Committee. I am aware that bulls and bears and birds of prey are anxious that the management should not be changed, but the interests of these animals are antagonistic to those of investing shareholders. A great deal of money has been lost by shareholders and gained by market operators consequent on the ups and downs of the shares on the market; but speaking in the interest of shareholders who buy their shares as a speculative investment, we want a manager who will not forestall the market, and who will not speculate in his trust. We also want a board which will act conscientiously, and which will not betray its trust, as the present board are said to have done in having, contrary to the advice from legal advisers and counsel's opinion, made a contract (that of the Rozan process) with our managing director, Mr. Probert.

SHAREHOLDER.

RICHMOND MINING COMPANY.

SIR.—I have no desire to anticipate the opinion of the shareholders upon the committee's report, nor should the committee have done so either, by applying, as they have done, for the proxies of shareholders, a very unusual course indeed, as it appears to me, for employees to have taken; but as correspondents in the mining papers, acting as I infer in concert with the report of the committee, have been pressed, very unnecessarily I submit, to introduce my name into the discussion, you will permit me, perhaps, to say that I am not in any degree related to Mr. Probert, not that the matter in itself is of much moment. It justifies me, however, in saying that if the other facts and faults paraded against Mr. Probert by the committee are based upon such fallacious grounds, and have been obtained by such indirect and unreliable means, that the shareholders may well put the whole report aside as unworthy of their faith and confidence.

I hope, in return for the undue prominence which has in this controversy been assigned to me, to be allowed to point out at the meeting of shareholders on June 18 that Mr. Probert still deserves their confidence, and that, divested of the personal rancour of the committee, the scientific commendation, which is obviously not their own, raises only one distinct issue—whether the refinery should be at Eureka or elsewhere; and then would have been whether the Rozan or Patteson process is the more desirable. But as Mr. Eilers represents them to be one and the same process, the point is not arguable unless it be to consider the merits of some other system.

If the committee should succeed in removing Mr. Probert, and the board too, for such appears to be their scheme, they should candidly have stated in their report how they propose to supply their places; this may possibly be a surprise reserved for the meeting. Of themselves we may fairly infer they have not the competent skill, and are certainly deficient in judgment. Then, who are to be their nominees?

The property is now a good one; the six years struggle it has had presents vicissitudes and events to the recollection of old shareholders reminding them how nearly and how frequently the company was about to be wound up, and how, but for the courage and

judgment of Mr. Probert, and the brave unselfishness of the board it would now be but a matter of painful memory.

Is the cup to be dashed from our lips, and are strangers and would-be appropriators to reap our harvest? J. P. BRIDGWATER.

Baton Gardens, June 13.

THE RICHMOND MINE.

SIR.—Shareholders who consider their own future welfare and peace for this mine will hardly hesitate to give their utmost support to the directors. The mine is doing as much as a mine can well do, and not very heavy expenses, and surely we can "let well alone." At any rate, to give Mr. Probert his passport just now looks much like "killing the goose that lays our golden eggs."

COUNTRY SHAREHOLDER.

RICHMOND CONSOLIDATED MINING COMPANY.

SIR.—It is said that those who live in glass houses must not throw stones; yet to throw light upon the recent litigation between the Richmond and the Eureka Companies the committee of investigation have had a glass model of the mine made similar to the one exhibited at the late trial, giving an exact representation of the Richmond and Eureka Mines from the surface to the lowest levels, and showing why it is impossible that the Richmond Company can hope that the Supreme Court will reverse the decision already given against them. Dissatisfaction is expressed by the committee that only 180,768. out of the 1,600,000. worth of ore raised has been given to the shareholders as dividends, but surely 11½ per cent. profit, which as the committee declare this 180,768. represents, is not so very bad, especially as they explain that other 83,000. have been transferred from revenue to capital account.

The committee's report, which cost over 4000. to print, is made up chiefly of extracts from the business correspondence between the London and Eureka offices, which ordinary men of business would have considered should never have been made public in the way it has—that is, in such a way as to induce the opinion among the Richmond employees that the managing director is an imbecile, and the board in London rather worse than he. It is usually supposed in business that "experience makes fools wise;" it is a pity, therefore, the committee could not wait for the result of experience to have produced effects. Mr. Probert has been some time at the mines, and it is not unreasonable to suppose that he has been able to ascertain when and how far recommendations made in 1873 ought to be carried out. Of course, I do not know the reason of one or other step which he has taken, but I know enough of mining to be able to say that to take up old reports and recommendations of itinerant inspectors and discharged servants and dangle them like a bull-fighter's red cloak before a servant, who, for the time being is working the mines profitably and well, is not the best possible way of getting the most hearty services out of him. At the present time the opinions of Clarence King and McGee may or may not be applicable. I am inclined to take Probert and dividends in preference to the committee of investigation and litigation, and I believe the majority of the shareholders will be inclined to go with me.

As to the hydrocycles, I am not surprised that Mr. Eilers, an imported German-American, should condemn them, since I understand they are not German inventions, and we all know that in obstinacy and clannishness the German miner and metallurgist is surpassed only by the Cornishman, though most Cornish and German intentions are remarkable only for their clannishness and inefficiency. The chapter in the committee's report, taking for example the twelfth and following verses, clearly shows that Mr. Probert has been careful to let the full board of directors know every step he has taken. The owners of the Rozan process declined to treat with a public company, and that they should so decline is only reasonable. To have sold the whole of the United States patent rights to the Richmond Company would have rendered these rights abortive; to have sold the Richmond Company the bare right to use the process would have rendered it impracticable to sell the American rights to others, except subject to the Richmond agreement, which would have depreciated the saleable value. Let us assume that Mr. Probert has made an arrangement which upon strictly legal ground he should not have done, what can it matter to the company? Messrs. Rozan would not deal with the company, and, therefore, the sole question to the company was whether such company would deal with Mr. Probert—a man they know—or with some stranger, who would, no doubt, have acquired the American rights, and of whom they would have known nothing. The Richmond Company "don't want to fight," although they have a colonel to direct the military operations of the committee of investigation, and a solicitor to advise that amiable body whether one of them may legally strike a head blow whilst his antagonist has only his left arm guard in readiness. The Richmond Company will surely be wise enough to know that both the colonel's and the lawyer's advice may be neutralised by the antagonist altering his guard. The Richmond Company only pay royalty of "the most favoured user" on the Rozan patents, so that none but lawyers will be able to see any possible ground for profitable litigation.

The main question for the shareholders appears to me to be whether the Luce and Rozan process gives results satisfactory to the company? At present I do not know whether it does or not, for I do not know what process they are using. If the result be satisfactory it need only be considered whether the company are paying a higher royalty than any other user—if there be but one user paying less the royalty paid by the Richmond should be at once reduced, and all excess refunded. This Mr. Probert would, no doubt, agree to. The committee have prepared a statement of accounts, showing a loss of 46,600. 4s. 5d. on the refinery; but in order to show this they have expunged 29,579. worth of bullion and drosses, which properly appears on the "returns" side of the account, and a lot of 132,657. on the "expenditure" side, which has already been otherwise charged, and which, therefore, is by the committee charged twice over. These two items amount to 62,236. which suffices to pay the committee's alleged loss of 46,600., and still leave 15,636. available for increasing the dividend fund. In this case, however, the actual cash profit on the single item is of secondary consideration; the great question is whether refining at the mines instead of carrying raw products thousands of miles with very poor means of transit is more profitable. The City merchant who employs a commercial traveller at 1000. a year salary, and thereby increases his profits 5000. per annum, does not argue that because nine-tenths of the orders influenced by the traveller come direct to the warehouse, therefore the payment of the 1000. salary represents a loss of 500. per annum. The merchant considers it a gain of 4000.; but this is a commercial detail far beyond the comprehension of the Richmond committee, though it is well understood by the majority of the shareholders.

Throughout the entire report the style is personally offensive to Mr. Probert, yet in almost every line the committee show their non-acquaintance with even the most widely-known general details of mining and metallurgy. They evidently do not know why a lead is so t or why a softened lead will never be willingly purchased at the same price as a naturally soft lead. There can be no doubt, even from the committee's statement, that the R. R. (refined Richmond) lead is of such excellent quality that it is scarcely distinguishable from naturally soft lead. The presence of an extremely small proportion of silver will make a lead appreciably harder and as the Richmond mineral is all auriferous silver lead, the fact that it is refined to best soft says much for the efficiency of the Luce and Rozan process, and the shareholders may well conclude that in times of ordinary commercial activity (the depression of the last two years has exceeded anything within memory) the lead alone would give the shareholders good dividends, whilst the gold and silver recovered from it would give bonuses far greater than the dividends themselves.

The Richmond has always been a "market mine," by which I mean that nine-tenths of the shareholders are not legitimate investors, but have become members of the company merely to speculate and gamble in the shares; they care less for the permanent richness of the mine than for "straight tips" as to an approaching rise or fall in the shares, so that they may "make their book" accordingly. This class of shareholders ruins the best mine in existence, and in that ruin involves the honest investor connected with

the concern. One of these Richmond "bookmakers," living at St. Andrew's, is referred to by the committee. In the *Mining Journal* of Jan. 20, 1877, it was stated that the "Richmond Mine was stopped by interdict for working beyond boundary," the telegram announcing that fact having been received by the directors on Jan. 18. The St. Andrew's bookmaker telegraphed to the Richmond (late) secretary to know whether the report was true, and was naturally sore because (from the directors' knowledge of Mr. Hall's amiability in telling everything to everybody he was kept unacquainted with the fact) he was told it was false, though Mr. Hall enlightened him on the following Tuesday as soon as he was himself aware of the service of the injunction. Now, it should be strictly enjoined upon all company officials to reply to no telegrams from shareholders whatever. No shareholder will ask information by telegram except for the purpose of what is virtually a fraudulent traffic in the shares; so that replying to their telegrams is assisting the dishonest to prejudice the honest shareholders. But, at the same time, the mere fact that these Richmond bookmakers are answered instead of treated with silent contempt by the London officials fully accounts for the two pages of what may be regarded as dealers' telegrams, to which the committee takes exception.

But these refutations and criticisms of the committee's report might be continued almost indefinitely, as there appears to be nothing unanswerable in the report, if, indeed, there be anything that does not answer itself. For my own part, I am much disappointed with the report, which although large and elaborate, contained really nothing that can be utilised by the shareholders.

Westminster, June 8. A COMMON SENSE SHAREHOLDER.

BRAZILIAN MINES—THE DON PEDRO.

SIR,—I am glad to find both "Mentor" and Mr. Houston adverse to a paper warfare. At the same time, I believe that a good healthy exchange of ideas, and a plain unvarnished statement of facts, will always be for the public good, and will assist, in a great measure, to avert any undue influence being exercised by unscrupulous speculators for the purpose of puffing up shares. The letter of "Mining Investor," in last week's *Journal*, appears to me to be more for the purpose of puffing up Capt. Vivian than for promoting the legitimate interests of gold mining, and although the letter may be written with the best of intentions, we may not forget the old adage that "a flattering friend is a dangerous enemy." "Mining Investor" states that Capt. Vivian brought the Don Pedro Mine from death's door to the brink of paying dividends, whereas "Mentor," in his letter of May 25, speaks of the important necessity of his return to England from the Argentine Mine, "leaving a sick mine to die in liquidation and ruin." I do not question Capt. Vivian's ability as a practical miner, but when "Mining Investor" states that very few men can be found who have had such experience in mineralogy it gives his opponents an opportunity of replying that there are very few men with the slightest knowledge of mineralogy who would have sent home from the Argentine as pure gold a stuff containing 50 per cent. of some worthless matter. If Capt. Vivian is all that "Mining Investor" makes him out to be (and I hope he is) he has a fair opportunity of displaying his ability at the Don Pedro, and if he succeeds in again paying the handsome dividends prognosticated I will give him the credit of being the best miner who has had charge of the property since the day when Messrs. Treloar and Symons made the mine pay such splendid dividends. It was under the supervision of those gentlemen that the Don Pedro Company paid their only dividends, and it was those gentlemen who recommended and purchased the permanent pumping machinery nine years ago, and there is every reason to believe that if their recommendation had been fully carried out at the time most of the gold that has since been taken out at a loss would have been returned at a profit. The question, then, may naturally be asked why the pumping machinery was not erected sooner? I reply that the company in England was ever too ready to take notice of every interested party, who having merely a superficial knowledge of the mine were unanimous in condemning the purchase of the permanent pumping machinery as extravagant and useless. I am careful to mention this incident, because after being so universally condemned for such a number of years there are at present many persons who are anxious to claim its paternity. That the state of the mine justified the managers in providing powerful pumping machinery at the time it was ordered may be gathered from the following facts which I copy from the reports published at the time.

In 1868 Capt. Treloar writes—"The Maquina lode we have proved in depth improves in quality. The mine captains are of opinion that the lode is increasing in richness as we descend." Again in the same year he writes—"In the bottom of the mine the general body is rich for gold, and bunched in its nature, but, on the whole, no such auriferous ground has yet been discovered in Maquina." In the following year—1869—the four mine captains in their joint report write—"Stopes in descending have gradually improved in quality, but latterly, from excess of water, have been suspended; we fear they will not be worked again until a proper system of drainage has been adopted." And Capt. Treloar in his annual report for the same year says—"In my opinion it will be impossible to follow the lode much deeper by animal power; the powerful pumping machinery must, therefore, be erected with all possible dispatch." In 1870 Mr. Symons again writes—"The curve has not been worked on for this year from this splendid body of lode; the greatest portion of our gold was extracted in 1868 and 1869, consequently it needs no further demonstration to prove the reason our produce has fallen off in comparison with former years; when in a few months the bottom of the mine is drained, and we have those rich stopes to work on I may be allowed to prognosticate good returns—returns that will enable commensurate profits to be declared." And the four mine captains in their annual report for the same year commence by saying—"Water has been the chief obstacle to our obtaining the brilliant results which in previous years attended our operations." Again, in the same year, Capt. Treloar writes to the board of directors, saying—"When I wrote you in October last it was manifest that a powerful pumping-engine was indispensable, and that the mine would not be itself again until it was erected—in 12 or 15 months; the powerful pumping-engine must, therefore, be pushed on with all possible dispatch."

It appears, then, from the foregoing remarks that the non-success of the Don Pedro Company for the last six or seven years is owing in a great measure to the unpardonable delay in erecting the permanent pumping machinery; I say unpardonable advisedly, because no sufficient reasons have or can be assigned for the delay. The machinery was paid for and on the mine in 1871, and in proof of the correctness of my statement I will quote from the annual report of the directors, issued March 21, 1871:—"The permanent pumping machinery, which has been paid for, was shipped in May last, and arrived in Rio in August, and owing to special arrangements having been made, the landing and dispatching have been greatly facilitated. In the transit of 170 tons of ironwork, a distance of 200 miles over narrow and imperfect roads, impediments must naturally be expected, but with the assistance of the company's mule troop the various parts are now fast arriving at the mines. No time is being lost in preparing the ground, &c. The wheel-pit (a very heavy excavation) according to last advice will be completed early in March, whilst the putting together of different parts would shortly be commenced. No effort will be spared to ensure the completion of the work by the required time." Shortly after the above statement was issued Messrs. Treloar and Symons ceased to be the company's managers, and a succession of managers has since been appointed, the result of which is only too well known to the unfortunate shareholders who paid the top price for their shares. "Mining Investor" states—"the former workers lost the lode;" this could not refer to Messrs. Treloar and Symons, inasmuch as it is an established fact that when they left the mine the lode in the bottom was much richer than it had been at any time previous. If "Mining Investor" can point out who was the former worker who lost the lode it may be the means of assisting the present workers to find it again, and thus render the company a valuable service in time of need. Having impartially stated a few facts relative to the permanent pumping machinery, I leave the public to judge to whom the credit is due for getting it on the mine.

In referring to the future merits of the Don Pedro Mine, I have no wish to influence any person who forms an opinion different to my own. "Mentor" evidently forms an unfavourable opinion as to the permanence of jacotinga mines in general, and there are many persons who are good miners who share that opinion with him, and will continue to do so until a precedent has been established to the contrary. Now, at the risk of being alone in this matter, I believe that gold in paying quantities will be found in jacotinga mines at a much greater depth than hitherto; indeed, I believe the time is not far distant when the problem will be successfully solved. I do not believe that those rich runs of gold in the Don Pedro have entirely died out. My opinion is that in descending they have met with a fault, which has thrown the rich runs of gold out of their ordinary course, and, consequently, they are lost to the company for the present. Every person who has had anything to do with jacotinga mines must know that the runs of gold in that kind of formation are very capricious, and that as soon as water is reached great difficulty is experienced in following them; one day the line of gold may be found dropping almost perpendicular, and the next it may be found shooting off at right angles, and in the space of a month its dip frequently changes to every angle between the horizontal and perpendicular. The greatest difficulty of all is experienced when the hard rock is encountered; this being the point where it is supposed the runs of gold die out, but which, in my opinion, is only a fault, which has been the means of turning the rich runs of gold out of their ordinary course. When a fault of this kind occurs it frequently baffles the skill of the most experienced miners, and I have known instances when a company on the point of giving up in despair have stumbled across the lost run of gold, and afterwards enjoyed many years of prosperity. I believe the Don Pedro to be capable of producing similar results, but if the company throw away their money by sinking in the hard rock for the benefit of science why then I pity the shareholders. It must not be supposed that I favour jacotinga mines at the expense of rock mines; on the contrary, I have a great preference for rock mines; I believe the rock mines of Brazil to be much more permanent, more regular in their production, more easily worked, and require far less skill in their development. Whereas the jacotinga mines when imperfectly drained will always be difficult for handling, and the produce more fluctuating. Mr. Houston, in his letter of the 1st inst., is perfectly correct in speaking of the eccentricities of jacotinga mines. I remember in 1867 the Don Pedro yield for one month was as low as 6318 oits. of gold, and in another month was as high as 29,060 oits.; and in 1868 the daily yield varied from 50 oits. to 1800 oits. But notwithstanding all this, if Capt. Vivian cannot find anything better from which to raise his produce than the large pillars left by Mr. Treloar and his party for supporting the mine he is not likely to show any permanent profits.

A fear of trespassing on your valuable space prevents my entering more fully into this matter for the present; I will, therefore, content myself by remarking that I differ entirely from Messrs. Treloar and Symons as to the manner in which the runs of gold in the jacotinga formation were formed. A CONSTANT READER.

Truro, June 11.

PORT PHILLIP AND COLONIAL GOLD MINING COMPANY.

SIR,—I desire to call the attention of the secretary of this company to the monthly *versus* the telegraphic reports from the mines, which are most contradictory, and why they should be left without correction is perhaps best known to the authorities; but, at any rate, they are most misleading to those who are apt to look upon your reports from Foreign Mines as reliable. I give below in juxtaposition two examples:—

Telegram, dated May 4. Month ending April 24.	Monthly Report.
"Gold obtained from company's quartz, 378 ozs.; fr. in tributaries quartz, 1205 ozs. Profit, 14,501. Remittance, 8001."— <i>Vide Mining Journal</i> , May 15, p. 552.	"The quantity of quartz crushed on both the companies and tributaries' accounts for the four weeks ending April 27 was 4647 tons. Total gold, 1349 ozs. 10 dwts. Profit, 5411. 17s. 1d., added to which was the previous balance of 17571. 10s. 1d., making an available balance of 22991. 7s. 2d. The amount divided between the two companies was 7591. The Port Phillip proportion of which is 4571. 10s. Remittance, 4001."— <i>Vide Mining Journal</i> , June 8, p. 619.

I must confess my utter inability to reconcile these statements. A senior wrangler may possibly be able to explain why the profit telegraphed as 14301. for the month ending April 24 is reduced by the monthly report to 5411. 17s. 1d. gross before being divided between the companies. It is most important that these telegram reports should be strictly correct and confirmed by the monthly reports—otherwise they are only traps that will deceive such investors as act upon such information. For the guidance of your readers it would be well for the secretary to inform us what is meant by the profit given in the telegrams; is it net or gross, and subject to division with the other company? I hope to be enlightened by the secretary as to the aforesaid discrepancies. X. Y. Z.

Wolverhampton, June 12.

AUSTRALIAN TIN.

SIR,—The gross yield of the Stanthorpe (Queensland) and New England (New South Wales) tin field for 1877 is as follows:—

Via	Stream tin.	Ingot tin.	Total yield.
Warwick...	3259 12 1 26 ...	137 14 2 5 ...	3397 7 0 23
Murrumbidgee ...	1817 11 3 7 ...	—	1817 11 3 7
Grafton ...	1700 1 0 0 ...	16 18 1 10 ...	1716 19 1 10

Total... 6777 5 1 5 ... 154 13 0 7 ... 6931 18 1 12

If the stream tin is reduced to pure tin at 72 per cent, fine the gross yield of pure tin will be 5034 tons, or about 1050 tons less than the previous year, the actual decrease of stream tin being 1733 tons. To your readers the reason of this great falling off of yield (just 20 per cent.) is of momentary consequence, and I must give you what information I can on this head. On Dec. 31 the year closed with a long and severe drought. For 14 months previous there had been very little rain, and a very partial fall; in the tin fields it was very severely felt, many mines having knocked off all hands but a care-taker for some months. Some men continued working in the present bottoms and beds of the rivers and creeks, and piled some good wash-dirt as the creeks got so very low. Other companies continued work, and accumulated large padlocks of wash-dirt in anticipation of the rain, while others having a supply of water stuck to the work so long as it lasted. Thus the yield was kept up to what it has been. During the drought a large area of new ground has been most successfully prospected in every direction, an enormous quantity of dead work opened out, cutting races, dams, &c., done. The price of tin all through the year has been very low; but against this the "getting" has cost less during 1877 than ever before. From information obtained I estimate the year's yield did not cost more than 16½ per ton bagged up, if so much. It must be remembered that there is a large Chinese population now permanently settled on the tin field, whose pay is from 2s. 5d. to 3s. per diem. Cornwall cannot compete with them, and the amount of ground that can be profitably worked at such prices is enormous. It is, therefore, certain that the price of tin in London has not as yet very materially affected the yield. The drought did not break up until Feb. 10, and the roads have been so bad and soft since that no very considerable quantity of tin has yet reached the port. I contemplate that the falling off of last year will be pulled up this present quarter, and the present year will be fully equal to 1876. The railway extension to Stanthorpe may now be considered an accomplished fact, as the Queensland Government has called for tenders for the construction of the first section (23 miles) and the second section (23 miles). The third section (20 miles into Stanthorpe) will not be let for another six months. The cost on carriage, delay, and damage on this 60 miles at present is more than from Warwick to London. It can, therefore, be well understood what a difference in cost this extension will make in the production of stream tin two years hence, when complete. On the New South Wales side of the tin field it is also intended to extend their railway from Murrumbidgee to meet the Queensland Extension, thus in a few years the rail will split the tin fields in two, running

north and south. Since the drought has broken up all claims and mines on the field have been worked full handed.

Again, at Cooktown, in the far north of Queensland, about 40 miles from the port, a large tin field has been discovered, as I have already advised. The first tin from this field was shipped from Cooktown during the quarter ended Sept. 30 last, when 7 tons 15 cwt. was forwarded to Brisbane. The drought then stopped the carriage and sluicing, but the men commenced piling wash-dirt. The rain came on Feb. 1, and continued all that month. The roads have since been impassable, but I hear that there is 100 tons of stream tin bagged up, ready for the trains. When it is considered that there are from 10,000 to 20,000 Chinese in the immediate neighbourhood this tin field may assume large proportions. During six months in the year no tin can arrive at port from this field until they have railway connections.

The Tasmanian tin fields are steadily increasing in importance and area; the islanders are overcoming one by one the fearful difficulties they have had to contend with, and the exporting of tin from the island is now an accomplished fact, with the certainty of increase, irrespective of price. The area over which the tin has been discovered is almost as large as the Stanthorpe and New England tin field. What the actual yield is at present I am not in a position to get, but it ought to be laid before your readers. The lodes are being worked in Tasmania, while only stream tin is washed in Stanthorpe and New England.

The only other metal that has exercised attention in this colony during the year, excepting gold, is antimony. At Neardie several companies have worked off and on, resulting in a lot of prospecting being done, and a few hundred tons of ore exported. A refinery is now being erected. Copper has almost failed in this colony during the year, owing to mismanagement and dishonesty combined. A little has been done in quicksilver, the high price giving our local mines a capital chance to start. Our enormous and varied coal seams are almost untouched, owing to the Government not providing the means of export. Still our railways are extending in all directions. Over 500 miles are at present let to contractors, and this next session of Parliament will not separate until 500 more miles are sanctioned.—*Brisbane, April 4.* RESIDENT.

NEW QUEBRADA COMPANY.

SIR,—I see by your report of the general meeting of the New Quebrada Company that I am represented as having said that in the three years I resided on their estate I had never known a drought. There is a slight misunderstanding. The fact is that in the year 1875 there was a very severe drought indeed. The forest was on fire for weeks. The plantations were severely injured. The village of Tucacas was on fire three separate times, and was nearly burnt to the ground. What I meant to convey was, without making a long speech, that even in times of great drought the Quebrada stream showed no diminution of the seasonable supply. Nor is there any reason to suppose it ever will, as from Sir John Hawkshaw's time at the mines there is no tradition of its every failing. Denbigh-street, June 12. GEORGE RANSOM.

THE WONDERFUL RICH SILVER ORES OF AN ARIZONA BONANZA—THE McMILLAN MINE, ALIAS THE STONEWALL JACKSON.

SIR,—Since the greatest riches of our silver mines in the Chilian stratified lime formations were produced, averaging as much as 99 per cent. in pure silver, and found in quantities of 15 and 20 tons at a time, and which were simply melted down in crucibles, I have seen nothing to equal these, except the 7 tons of ore now on exhibition at the San Francisco Stock Exchange, from the Stonewall Jackson lode (of the McMillan Mining Company), Arizona. The ore runs from \$10,000 to \$20,000 to the ton, and is the richest ever exhibited in San Francisco. Professor Martin is the President of the McMillan Mining Company, and Judge Overton, of Santa Rosa, one of its principal owners. Evidently the stockholders of the Stonewall Jackson have struck a bonanza. By-the-by would it not be a good idea to devote the rear basement of the Exchange to the permanent display of the Pacific Coast mineral wealth? Visitors could then have an opportunity of seeing specimens of the ore of every mine in the market, and in time the collection in an industrial sense would be far more useful than any to be found in museum collections. The ore consists of massive horn silver and pure silver, crystallised all throughout, and mostly in the beautiful shape of fern leaves. These 7 tons are only a small portion of what this mine has been producing all along. These parcels are melted down in crucibles. It is a great pity, as the crystallised specimens would fetch a good price in London, although they are now being sold for almost their weight in gold.

You are aware how rich our Chilian silver mines have been, even to the depth of 2000 ft., producing thousands of tons of ruby ores, which have been sold in Swansea for the last 26 years. One shipment of 400 tons of ruby ores from a depth of 1200 ft., from Mr. John Sewell's mines, averaged 5000 to the ton. The Stonewall Mine is still very shallow, and is a true fissure vein; and, consequently, by analogy ought to produce the same class of ores in depth as our mines in Chili. H. SEWELL, M.E.

318, Pine-street, Room 34, May 20.

OLD TREBURGETT MINE.

SIR,—I am much surprised to see that the materials on the above mine are advertised for sale by public competition on the 15th inst. I felt certain that before this time some person or persons would have taken the mine in hand, with the materials, and put it to work in a good, brisk, miner-like manner, and that soon we should have heard of a dividend being declared. For it is without controversy, I think, that it is a splendid little mine, with an abundance of rich silver-lead ore, for the miners publicly declare that they can make the lead produce 300 per ton in the present state of the market, and they told us in the *Mining Journal* where the lead was, position and size of the lodes, and other valuable information. As I was a shareholder in the time of the old company I have, of course, lost my money then speculated, but, nevertheless, I have such faith in its future prosperity, with a small amount of capital invested in it, a smart staff of really good directors, and altogether different management to what it has been in the past, that I am prepared to take 500 shares in it at the price I gave for the old ones.

AN OLD SHAREHOLDER.

CORNISH MINING AS A PROFITABLE SOURCE OF INVESTMENT.

SIR,—Copper, tin, and lead mines must participate largely in the general rise which follows a long depression, and the firmness of the metal market, confirmed by the late rise in copper and tin, is a strong indication that we are on the eve of a revival in the pursuit of mining. Although the chances in a rising market are ten to one in favour of the investor it must not be forgotten that there are some mines destitute of the smallest chance of ever becoming profitably productive, and should be avoided, while those of real merit have been so neglected as to reduce their stock to a nominal value. It is from such mines, of which there are many known to the writer, that the public can now secure for themselves a rich reward. The panic of some twelve years ago was followed by a rise in some mines of as much as 500 per cent. in one month, and those who secure shares in the leading mines of the county will have a similar benefit in the reaction now taking. Apart from the mines that have weathered the unparalleled depression the present is a favourable time for the employment of money in the development of mines in new or unexplored ground—the capital required to prove the existence of large bodies of mineral in the great copper district of Gwynnasp being comparatively small to the revenue derived from one of the many deposits known in the neighbourhood, the operation of the miner only being required to open up such properties as shall compare favourably with any of the rich mines in by-gone days, to which many of the leading Cornish families are indebted for their influential positions and wealth. The capital required for such purposes will not amount to a tithe part of that charged as promotion money

alone for the resuscitation of some of the old worn-out mines of the county. To ensure success the working of such new ground should be as in days gone by—on the principle of equitably advantageous co-operation, thus opening a field for the investor requiring but a small amount judiciously expended to ensure the realisation of copper mines of very great value.

CHAS. BAWDEN.

Cornwall, June 12.

REMINISCENCES—No. VII.

SIR,—I take it for granted that you will accept for your excellent and widely-circulated Journal not only what I remember from observation and hearsay, but also matters of fact which I have read. Therefore, I will firstly subjoin a few instances of Cornish longevity. Carew has recorded the following:—"One Polzen (says he) lately living reached unto 130 years; a kinsman of his 112; one Beauchamp to 106; John Brown, the beggar, a Cornishman, by wandering out-croeth a hundred winters." He speaks in another place of Landewednack, who died and was buried there in 1683, is said in the register to have been above 120 years of age. Dr. Borlase relates an anecdote of his walking to Penryn and back, a distance of 30 miles, not long before his death, on the authority of Mr. Erisey, who met him on the road. Michael George, sexton of the same parish, was buried March 20, 1683, aged, as is said in the register, upwards of 100 years. Dr. Borlase speaks also of an old man of the name of Collins, upwards of 100, whom he saw on a tour to the Lizard; this man (Sampson Collins) was buried at Ruan Major in 1754, aged 104. Dr. Borlase tells us also, on the authority of Mr. Scawen, of Mollethead, of a woman who died at Gwithian, in 1676, at the age of 104. Her name was Cheston Marchant. The tradition of the place is that she had a new set of teeth and new hair in her old age, and that travellers who came to see her out of curiosity frequently took with them a lock of her hair; it is said, also, that she spoke only the Cornish language, and that she was many years bedridden. Mr. Polwhele mentions Henry Brenton, a weaver, of St. Wenn, who died in the reign of George I., aged 103; Mrs. Trevanion, who died at Bodmin in 1769, aged 107; Mr. Richardson, of Tregony, who died in 1770, aged 102; Mrs. Blanch Littleton, of Laniverry, aged 101 (the three last on the authority of the register); a lady at Eglosayle, aged 112; Maurice Bingham, a fisherman of St. Just, who died in 1780, aged 116; Elizabeth Kempe, of Wendon, who died in 1791, aged 104; Catherine Freeman, a Scotchwoman, who died at Falmouth in 1793, aged 118; John Roberts, of St. Keverne, aged 107; Priscilla Rouse, aged 101, and Edward Roberts, aged 102, both of Manaccan; Mary Sarah, aged 102, and Jane Studford, aged 102, both buried at Gluvias in 1803; Mary Jenkins, of Crantock, then (1806) lately deceased, aged 102 (her father is said to have attained the age of 101, her mother that of 103).

Mrs. Zenobia Stevens, of Towednack, who was buried at Zennor in 1763, at the age of 102, was tenant for 99 years of the tenement of Trevidiga-Warra, held under the Duke of Bolton's manor of Ludgvan-lease; and we are informed from good authority that when she went on the expiration of the term (being, of course, in her 100th year) to the Duke's court, at St. Ives, she excused herself from drinking a second glass of wine because it was growing late, and she had some way to ride home upon a young colt. Her daughter, Mrs. Baragwanath, lived to the age of 93 or 99. Elizabeth Fradd, aged 103, was buried at St. Kew in 1803. Henry Martin, aged 101, was buried at Stithians in 1812.

A lady died in Truro a few years ago, named Cargenwen, aged 105. She had been a widow nearly 80 years, having lost her husband shortly after her marriage. When she was 90 years old, in walking up Lemon-street with a friend, she remarked, "I cannot tell how it is that I cannot walk up hill as I could formerly!" A great-aunt of mine, who died about the year 1840, lived to be 102; one of my uncles lived to be 94, and my father and his two brothers lived to be 90 each (within a few months). My great (maternal) grandmother died aged 96. In the West Briton of the 10th inst. there is a notice of the death of James Knuckey, of Stithians, aged 98; and of Mrs. Knott, of Calstock, aged 101; also of Thos. Symons, Tintagel, aged 89.

I have before me at this moment a book containing this brief paragraph:—"Wadge, of Upton, in Lewannick, a reduced family; the representative of which is now a parish pauper." This name reminds me of Mr. E. Harvey Wadge, late of Stradbroke Hall, Ireland, now in America, a convict, who a few years ago held offices in Manchester, and set on mines, &c., in numerous places. His once prosperous career, however, soon ended in disgrace.

In speaking of longevity, I omitted to mention Peter Martin, late of Helston, sexton of St. Michael's Church there, who lived to be about 104. He died about 30 years ago. He used to talk about Mr. Wesley, whom he knew from having, when a postboy, driven to St. Ives, to preach. In crossing Hayle river the horses and carriage swam, the tide being in. When on the water, Mr. Wesley said, "Driver, what is your name?" "Peter, sir," said he. "Don't fear, Peter, we shall not sink." Mr. Wesley, on arriving at St. Ives, finding the congregation waiting, did not stay to get dry clothes, but went and preached as he was. His brother Charles used to call him the "iron man," because he could endure, and not succumb under such wettings as he was wont to receive in his travels, which were generally on horseback, till late in life, when he used to travel in a close carriage.

The mention of Helston has reminded me of a few incidents which occurred there long ago. The Wesleyan Methodists held their class meetings, or meeting, in a house in Menage-street. One evening, when they were assembled in that room, one of the members suddenly rising, said, "We must leave this place; we must not remain here;" and walked out immediately, the rest following him. They had not gone far before the house was blown up by gunpowder, which had been stored in an adjacent room. Was not that a providential escape? An old Wesleyan preacher, who died at Helston a year or two ago, aged about 95, pointed out the spot to me. This incident occurred in Mr. Wesley's time. The preaching-house at that time was at St. John's, near Helston, now occupied as a dwelling-house, and before that used as a carpenter's shop.

The second incident is this: A man called Hamill, a draper, who lived in Coinage Hall-street, was, I believe, a zealous partizan in politics. In conversation one morning with a fellow-townsmen something ridiculous was said, which so acted upon the risible faculties of the draper that he died suddenly from irrepressible laughter!

The third is this: There was living at Helston about a century ago a gentleman who was of a very haughty temperament; one day he was dining at the hotel there with a party, including Mr. C. Wallis, a solicitor; the gentleman taking up some pudding hastily, scalded his mouth, which excited an involuntary laugh from Wallis. This circumstance so offended the proud gent as to induce him to send a challenge to Wallis to satisfy his honour! Mr. Wallis, as a man of sense, replied as follows:—"Sir, I have a wife and family to support; if you will make over to them, before we meet, one half of your estate, to be enjoyed by them in case of my death, I will go out to be shot at by you!" That brought no reply. Mr. Wallis gave me this anecdote about 55 years ago.

Opening Carew's History of Cornwall I lighted upon a proverb which is engraved on a stone in Pengerrick Castle, in Breage:—

"The one nedith of the other ys helpe."
"The lame wyche lacketh for to go
Is borne upon the blinde is back,
So mutually between them two
The one supplieth the other's lack:
The blinde to lame doth lead his might,
The lame to blinde doth yield his sight."

The above is several hundred years old.
On every Whit Monday (weather permitting) there is open air preaching at Gwennap Pit, which is situated about 1½ mile eastward from Redruth. It is a circular pit, about 100 ft. in diameter, having concentric grassy seats from top to bottom. In John Wesley's days it was not of the present geometrical shape, but a rough mining pit, probably formed by the caving in of a shaft and shallow excavations. Mr. Wesley preached here for the first time on Sept. 3, 1743; again, April 2, 1744; June 22, 1745; Sept. 4, 1746; July, 1747; August, 1750; 1751, 1753, 1755, 1757, 1760, 1762, 1765, 1766, 1768, 1769, 1770, 1773, 1774, 1775, 1776, 1777, 1780, 1781, 1782, 1787, and 1789. He says, in his Journal, "I preached in the evening at the amphi-

theatre, I suppose for the last time, for my voice cannot now command the still increasing multitude. It was supposed there were now more than 25,000. I think it scarce possible that all should hear." It was his last visit; he died March 2, 1791, aged 88. I attended there yesterday (Whit Monday), where I had not been for about 40 years—on such an occasion. Several thousands of persons were hearers of the sermon in the pit, but many hundreds outside could not hear. All descriptions of vehicles were used for conveyance—omnibuses, cabs, gigs, wagonettes, carts, &c. Refreshments were spread around. It was a day of pleasure there, and at Redruth, and Helston. Whit Monday fair, at Helston, is a grand gathering. To-morrow (Wednesday) is the great annual fair at Truro; but it is not so well patronised as it was 40 years ago.

June 11.

OBSERVER.

SOUTH DE ERESBY MOUNTAIN.

SIR,—My attention having been called to my report on this mine, dated Oct. 6 of last year, and printed in the Financial Record of the present month, in which I stated my opinion that the D'Eresby Mountain lodes with others traversed this sett; I wish to say that that opinion had no reference to the Gorse lode, because the discovery on that lode in D'Eresby Mountain had not been made. The Gorse lode does not run through that sett, but through the Aberlyn, a fact which is supported not only by the oldest and most experienced miners of the neighbourhood but by the tracing of the outcrop and its internal evidences, which I have to-day pointed out to an old experienced miner from London, who has gone with me over and underground in both mines, and who may possibly send you his opinion of the mines. It is preposterous for any "mining authority" paying a casual visit to the place to set up his opinion against one who has examined closely and surveyed every inch of ground.—*Laurest, June 12.*

JOHN ROBERTS.

THE LATE DOLCOATH ACCOUNT.

SIR,—Will you allow me to put somewhat more clearly before your readers what I said at the meeting of the adventurers than appears in last week's Journal? I ventured to remark it was my firm conviction that at no very distant period Dolcoath would be in a position to pay 1½ per share dividend (4296½ profit) on the twelve weeks working, with tin ore at 40½ per ton. I have been connected with the mine 27 or 28 years, and had been in the habit of closely studying its points, and at no previous time were the prospects so good. The report now before us shows no less than six shafts and three winzes sinking, of the value of 287½, collectively an average of 32½ per fathom—the most important being the engine-shaft, now down about 12 fms. under the 333 fm. level, or 350 fms. below the adit, about 390 fms. from the surface, which is quoted 80½ per fathom for the length of the shaft.

I referred to some remarks made lately by Mr. Gladstone, which were well worth pondering in their bearing on the interests of Cornish mining at this particular crisis. He said—"The resources of trade and capital are so much increased, and the number of channels into which they can be turned, and the communications of those channels among themselves have been so multiplied, that there is no fear now when any place assumes a bold front and boasts of extraordinary progress in some branch of industry, that other places competing with it in that branch of industry will permanently suffer the result of cheapening of commodities and the stimulating of inventions, throwing other places back upon their resources, and teaching them to study how they can avoid the waste which too great a plenty of natural gifts and treasures may have encouraged, as has been the case in some of the mining districts in England. In this we find that the multiplication of those points and centres of production, instead of acting in the end unfavourably, has actually resulted in the increased prosperity of those very centres of production which at first they threatened to destroy."

It should be remembered that neither Dolcoath, nor in all probability any other mine in Cornwall, has up to the present time derived any actual profit or advantage from the use of the boring machines, neither are they likely to do so for many months to come; on the contrary, it has entailed a considerable outlay. That ultimately very material advantages will arise when the ground is fairly laid open no reasonable person can doubt. Whether we may succeed (as Mr. Frank Barratt said at Dolcoath account) they are doing in the iron mines in the North of England, in driving at two-thirds of the cost of manual labour) remains to be proved; I see no reason why not. This, with four, five, or six times as fast, will effect such changes that will enable the good old mines of Cornwall to compete with Tasmania or any other tin producing country.

London, June 10.

M. G. PEARCE.

THE LOW PRICE OF METALS, AND THE RESULTS ARISING THEREFROM.

SIR,—From the very high prices obtained for iron, tin, copper, and lead in the years 1875 and 1876, and for a long time previous to it, no other result than what has really happened could have been expected, and it will act as a good lesson to many an older man than the writer to be prepared for such occurrences should they ever again be repeated in our generation, of which I think we have much reason to doubt. That a great many persons connected with mining have felt the pinch from it there can be no reason to doubt; but it is equally doubtful whether in the long run greater benefits may not be derived from it than, let us hope, the temporary mischief it has occasioned. Let us look at some facts connected with the case. Some of the greatest and best of the tin mines in Cornwall, when they were getting from 70½ to 80½ per ton for their ore, were dividing money amongst the shareholders, leaving an indebtedness to their bankers and merchants of more than 20,000½ sterling. Had the price of metals continued there can be but little doubt this hoodwinking of the shareholders would have continued; but once those parties who allowed these things to be done saw the perilous position in which they had placed themselves, and not only themselves but all those connected with them, they were bound by common honesty, and more so for their own safety, to lay bare the whole truth—and it is most fortunate they did so as soon as they did, as they were met in a much better spirit than could have been expected by their co-adventurers, and in such a manner as would not have been the case if the affairs were in the hands of less magnates. It has, therefore, been the means of conducting business in cost-book mines on a proper footing, and in the manner it was intended by the rules of the proper Cost-book System. But, again, let us look at the cost of then producing the ore with the cost of producing now, and we shall find that the ore is now produced at one-half the cost it was then brought to market; and this alone is sufficient to show into what a disgraceful method of working most of the Cornish mines were then being carried on. No boring machinery, no attention to the proper cleaning of the ore, nor the waste of tin that was daily sent away from the different mines for others to make a fortune on.

Fortunately, necessity has no choice, and the Cornish miners have no other choice than to use economy in working, apply the right working power, and to properly dress the produce of the ore, to obtain results which they never dreamed could be obtained; but if they think, or rather if it is thought, that anything like perfection has been obtained in the working of the great mines in Devon and Cornwall I will venture to assert as much remains to be achieved, and can be achieved with proper attention, in the next three years as has been effected in the past.

In looking over the Supplement to the Mining Journal of May 25 "Omicon" says—"I have known Gorse and West in daily attendance until the engine was ready to work—working and examining the parts;" and so have I known these gentlemen to be so employed, the former being a relative of mine. If we had more of such gentlemen and less interference with them of the now great mine managers, who, of course, must know everything from a 144 in. cylinder steam-engine down to a penny whistle, we should see the duty of steam-engines. What it was when I left the county of Cornwall 38 years ago in comparison with which the engines reported that have done more than the average duty by Mr. Lean, in the Journal of last week, would cut but a sorry figure. It is almost laughable to hear a lot of people doing nothing but complain and

grumble, making certain of better times and prices. The sooner all this nonsense is given over the better. Let us stick to work in a proper way, and we can contend successfully against the Spanish mines with lead, against the Cape and other rich mines with copper, and against the Australian mines with tin; and those who are not prepared to produce these ores with the best methods now known and being adopted for doing so must succumb to the times—and the sooner that all know they have an uphill battle to contend with, not for a day, or a month, or a year, but for all time as far as we are concerned, will do well to look the facts of the matter in the face. We have the sinews here in good workmen, and it only remains for those who steer the ship to know how to use the compass to land them safely, and those who do not must reach a rocky shore.—*Aberystwith, June 12.*

ABSALOM FRANCIS.

GREAT DEVON CONSOLS—THE FIVE-WEEKS ACCOUNT.

SIR,—I have observed the proceedings of this company as reported in last week's Journal, and beg to differ with the Chairman that the five-weeks account to the working miner is a mere matter of sentiment. During the 20 years I was among them in harness I often felt it most severely, and have hundreds of times heard it characterised as the "accursed five-weeks account" by the most moral and considerate among them. To the tributers the loss is not so heavy; but its great length even to them is a serious source of annoyance, and to "day men" also—whilst to the tutwork men it is a positive loss, as it is well known that the agents are bound to make as near an average of the monthly expenditures as possible. Mr. Samuda appears to me to suggest wisely.

MARTIN BOUNDY.

Birmingham, June 6.

DEVON CONSOLS.

SIR,—The very able remarks which have appeared in your Journal from "Looker-On," and your excellent Truro correspondent, Mr. Symons, likewise "Pro Bono Publico" are all so much to the point that it is unnecessary to say more than that I must add my own protest against our directors in any shape giving way to the most unjust demands of ill-advised men. It has been remarked that it is the officials (and some of their relatives) and monthly men that are encouraging the miners to "stick out." If this is so, as it has been suggested, why not have a thorough clear out from the highest to the lowest? There are plenty of intelligent and honest agents and other monthly men, as well as miners, ready and willing to go and take their places at a day's notice if necessary. Besides, if, as has been clearly shown, there is such a large loss on the monthly sales of copper ores, and as the other commodity on hand is unsaleable at a fair price, why cannot we reduce our agency and other monthly men, husband our resources, and not sell any of our minerals for a few months? By this means we should in the end find ourselves great gainers instead of heavy losers. Therefore, as a shareholder, I say employ the smallest possible number of hands at the 12 monthly payments as specified, and let us hope that with a turn in the state of trade we may expect better prices for our ores, so as to save the company from making heavy monthly losses.

Plymouth, June 12.

A SHAREHOLDER.

MINING IN NORTH WALES—PANT-Y-MWYN.

SIR,—As the mining company named in the heading of my letter has almost reached the end of its sixth financial year, and taking into consideration the increased vigilance in superintending the operations at the works, the progressive results with which we have been favoured at various times since the annual general meeting of shareholders in 1877, and the large additional real capital which doubtless accrued at the close of the year 1877 by sale of new shares under exceptionally inviting conditions, I presume I am not premature in supposing that a reasonably good dividend will be declared at the ensuing general meeting in August. However that may be I feel assured from what I have heard, from those most likely to be well informed upon the subject, that the most implicit confidence is placed by the large body of shareholders in the present board of directors and the indefatigable secretary of the company, for endeavouring to secure matters in the manner most conducive to the interests of the members. If not infringing too far upon your space, permit me to offer a suggestion through the Journal, which may have an effect equally as good in its result as if forwarded by me direct to the company's executive, with the advantage that no personal knowledge is incurred. I simply allude to the desirability of accompanying the directors' general report and annual statement of accounts, which will be forwarded in due course to each shareholder, with a practical detailed statement from the individual charged with superintending the mine, embracing the chief features and occurrences from July 1, 1877 (the day following the closing of previous accounts). There can be no difficulty in this, as it will merely form a condensed abstract report from his diary of events, which doubtless is regularly posted up daily for his own professional guidance. It appears almost superfluous for me to add that the adoption of the course I have indicated would prove very satisfactory to those shareholders who cannot make it convenient to be present at the annual meeting in Liverpool, either owing to pressure of business, distance from that town, or unavoidable causes, as they would then have a good idea of the manner in which the working details were being carried out, and the prospects presented of realising a sufficiently remunerative interest for the risk run in sinking cash in the company. I believe there are few who do not desire to be recouped fairly in this or any similar concern. The report to which I refer would only (if my memory serves me aright) be a continuation of the system previously adopted when there was a managing director—a post now extinct.

June 11.

AMICUS.

THE WILD DUCK, OR SPORTSMAN'S ARMS.

"Now that we are met again," says Jimmy Dowd, "I want to know of any of es can tell how long ago it es sence the first engine wor put up in South Frances." "Iss, sure," says Old Tom; "I can tell ee; and tes about 56 year ago. Uncle Jimmy Vincent wor capn there, and it wor his son John's house there by 'Piece' all the dispute wor, years sence then, about the bounds of West Basset and South Frances." "But," says Uncle Henny, "lev me tell ee, Old Tom, the first engine put up in South Frances was a good way farther south than where the engine is now, and upon a different lode, nearer Grylls House, and, tho' tes the same sett, South Frances now es a different thing from the lode worked near 60 year ago." "Well," says Old Tom, "what you say, Uncle Henny, is very true, but Uncle Jimmy Vincent to his dying day was sure that the south lodes would be good in depth. Tes curious, too, that the first engine in Bolenowe bal was put up the same time as South Frances, and by all accounts, if they sticked to the two main lodes going west under old men's workings and old clay pits stream works, the wor sure to have a rich bal, but their slight trial wor for copper, and if the looked for tin the prize would be found." "I agree with ee," says Jan Jewell, "and I often tho't how strange 't wor that people didn't sink old men's works deeper instead of running about for new places. We may think what we mind to, but the old men wor good miners, and discovered all the best lodes in the county, and I'll be bound that no man in the room ever seed an old man's works that didn't produce mineral, and I tell ee more—that there is a purty keenly rich piece of tin ground going west from Bolenowe old bal, and long ago old Kinsman used to be streaming for tin from Troon Moor to Chycarne Moor on the backs of some of the then lodes." "Iss, sure," says Old Tom, "and one of them is a little to the south of Old Skease P—s house, and I suppose you all heerd' what happened to Old Skease when a keepped shop." "I never heerd'," says Jimmy Dowd, "so less hab'n, Old Tom." "Well, you see 'twas like this here; Skease trusted the people from month to month, and was owed a lot of money, and couldn't get it, so off he went one day to Helston to ax a lawyer if he could get the money. The lawyer said he could, and for Skease to bring his books, and he'd make them pay in no time. 'But,' says Skease, 'I've no books.' 'And how do ee keep the accounts?' says the lawyer. 'Why, up agin the hale-door in chalk scores,' says Skease. 'Very well,' says the lawyer; 'bring in the hale-door, and swear to the accounts, and I'll make them pay, and no mistake about

It. So next week away went Skease with the hale-door pon his head, and for fear his hat would rub out the chalk scores he turned the chalk side up. When a got in sight of Helston a thot 'twould be a good plan to touch pipe a bit, and consider to himself what a would say to the lawyer, and what a would do with all the money, but you see while Skease wor trotting along towards Helston there wor, unknown to un, the door being upon his head, a gentle dew and fog, and when Skease took up the door he found every bit of the chalk scores washed clean out. So poor Skease had to come home again, and never got a penny, for the rogues, when they knowed the hale-door wor washed clean, used to loff, and cal out after the poor old fellow 'Fire away, Skeasey.' "That's a true story as ever wor told," says Uncle Henny, "for I knowed Old Skease and all his family." "So ded I," says Jan Tenby, "but I wonder what had the old men to guide them to find all the lodes worked upon. Wor it by streamling, or how? Tas hard to say, no doubt, but I've heerd 'twas sometimes by fire." Well, says Old Tom, "lev me tell ee what happened the time North Basset work-d. Gracey P— wor out one fine evenen milken her cow, and all at once shee'd a great light. She looked under the cow's belly, and in a corner of a field shee'd a blaze of fire rise out of the earth, and then run all along upon the ground. When Gracey went in she told her husband what shee'd, and he said North Basset lode must run near that place, and a few days after this the capns wor going over the ground before fixing a place for a new shaft. So Gracey went up to them, and axed what the wor doing. 'We're thinking,' the said, 'to sink a new shaft.' 'Well,' said Gracey, 'if you want to cut a coose of ore you must sink the new shaft in that there corner,' pointing to the spot where shee'd the blazes of fire, and sure enuff the sinked the shaft in that there spot, and cut a fine coose of ore, and the shaft is caled Gracey's shaft to this day."—From Cousin Jack's Unpublished MSS.

THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week business has been on a smaller scale, owing to the Whitsuntide holidays, as well as the fortnightly settlement commencing; but transactions are now being entered into more freely for next settlement—June 28. Tuesday was continuation day, and particulars of the business then done are given below. There is still a universal belief that the troublesome Eastern Question is, owing to the exhaustion of Russia, and the prompt preparations of Great Britain, likely to be quickly settled on a permanent basis at the Congress, and in that case the satisfactory commencement of more active business, and better prices than the past few weeks have witnessed, will receive a most powerful stimulus.

In shares of iron and coal concerns Benhar have advanced 6s. 3d. per share, and Omoa and Cleland 4s. 6d.; also Ebbw Vale and Monkland each 2s. 6d., but Cairn-table are 10s. lower. West Mostyn debentures are still offered, although it is stated that a scheme is now preparing whereby it is expected all the capital necessary to develop this valuable property will be subscribed by the shareholders. In regard to the general appearance and prospects of the iron and coal trades the probability of a time of peace in Europe, a recovery in trade in Canada and the United States, and the continued colonial prosperity, are important indications of an improvement. One great blow to these trades was the substitution of steel for many purposes that iron had hitherto been used, but nearly on all hands now the ironworks have been adapted to produce steel, while the long-continued depression has necessarily greatly reduced the cost of labour and raw materials. From the reduced cost of labour, therefore, as well as improved machinery, and the use of the most practicable of cheap foreign ores, the British iron and coal trade is again in a position to reap the full benefit of the recovery in trade that appears to be about to set in, for the foreign competition may now be considered overcome. Andrew Knowles and Sons are at 5½ d. Bolckow, Vaughan, B. 3½ d. Brown, Bayley, and Dixon, 8½ d. Charles Cammell and Co., 9½ d. Consett, 17½. Ebbw Vale, 6½ to 7½. John Brown and Co., 12½ d. Llynvi, Tontu, and Omoa, 5. Nerbudda, 17s. 6d. Rhymney, 19. Scottish Australian, 32s. 6d. to 37s. 6d. Staveley, A. 1½ prem.; ditto, C. 7½. Thorp's Gawber Hall, 40s. to 50s. West Mostyn (preference), 25s.

Shares of foreign copper and lead companies have been in fair request, but Cape have lost 20s. and Durais 1s. 3d. of the lead advance. Rio Tinto 7 per cent. have advanced 20s., ditto 5 per cent. 15s., and Yorke Peninsula (pref.) 5s. Tharsis touched 23½, but are again tending upwards. The Cape Copper has announced a dividend of 17s. 6d. per share, payable June 24. Defence have been lodged to the action at the instance of the Huntington Company against Mr. William Henderson and others, in which the company claims to have the contract for the purchase of the mines cancelled, or a sum of 150,000 paid to them. Cape are at 34; Hornachos, 13s. to 14; Kapunda, 1s. 3d.; Rio Tinto 5 per cent., 64½; Yorke Peninsula, 7s. to 7s. 6d.

Shares of home iron and coal firms are quiet. The next sale of the Glasgow Caradon Company (computed 230 tons) will compare with sales of 240 to 260 tons for last month, and some years past, but it is probable the money realised will be better. Probably the prices of home mines of all kinds are now as low as they are likely to be. Looking at lead mines, which may be considered the most doubtful, it appears the course generally pursued is to raise only sufficient at present low prices to pay costs. This restricted output must tend to harden the lead market, irrespective of that permanent recovery a general revival in trade would bring about. Investors ought, therefore, to begin to lay out their money on an intelligent principle of selection, dividing it over half a dozen well-selected adventures, and this must as a rule pay well, for success in a couple, or even one, is almost always obtained, recouping not only all depreciation in the others, but paying as well, handsomely on the money invested in all. The most popular course is to divide the investment between dividend and non-dividend mines, and where an immediate income is desired this is, of course, necessary; but the greatest profits are, perhaps, made in purchasing non-dividend or progressive mines alone. Such of them, it is evident, as are in good districts, with first rate prospects of making discoveries and manage to pay their way or have a margin of profit for developing fresh ground, must have far greater margins for a rise than shares in any of the great dividend mines, which are, as a rule, so fully proved that their value, future and present, is fully calculated in the prices of the shares. It must not be lost sight of that success does not depend solely on the intrinsic value of the mine; there must likewise be ample capital for development, and an intelligent expenditure thereof. There are not, certainly, many of these small progressive mine shares we are alluding to, but still—scattered here and there in good districts—they can be found, and mostly in the hands of local holders.

Roman Gravel is said to be looking well in all the south levels; this is one of the sure dividend-paying mines of the country, for it is yet in comparatively shallow workings, while the rich deposits of ore may extend to a great depth. At North Roman Gravel the level is being driven as fast as possible from the new lode to meet the old level, where a great deposit may be got in a very short depth, the forebore being in a very good lode 4 ft. wide. North Hendre is stated to be following the general plan and holding its ores for better prices, selling sufficient only to defray working expenses. It will be remembered this company lately acquired an adjoining property, one of the first likely to benefit by the success of the Halkyn dist. let drainage scheme. Gorseid and Merlyn Consols is another of the mines pursuing the same course with its lead. The operations there are generally progressing very satisfactorily, and great hopes are formed about the latest discovered new lode, the fore-rear t in the upper level being in very rich ore. Rhosmor and Deep Level share are in great demand, particularly the latter, at 70s. to 75s., and they will go to 75s. and 100s. in a few months, owing to the Halkyn district drainage tunnel rapidly decreasing the distance between the old lode and the others known to run through this property. This old lode is the one which returned the first Marquis of Westminster nearly 2,000,000. sterling as profit, in about 16 years working. If known in the chief markets these shares would no doubt be run up to at least three times their present price. Another of the best speculations in the kingdom is Rhyl Alyn. The old mines were among the richest in Flint before drowned out, but if successfully drained by the drainage company's tunnel they would have a heavy rise—200s. or 300s. each. Barmfyle is at 5s. Boffleins, 17s. 6d. to 22s. 6d. Comberton, 5s. D'eresby Consols, 10s. Gunklake (Clitters), 15s. to 20s. Pateley Bridge, 45s. Rhyl Alyn, 30s. West Tankerville, 9s., and ditto (pref.), 20s.

In shares of gold and silver mines the principal dealings have again been in Richmond, which have a bid at between 11½ and 12½. This week's run is 864,000, or \$18,000 less than the previous week's, one day having been lost repairing machinery. The accounts recently issued show a net profit of 105,000, but for the ten months ended Feb. 28 last the works were only going six months, so for that period such a profit on the share capital of 270,000, is immense. The debentures need not be considered, for they fall due next March, and must be easily redeemed. Riches such as are here disclosed must not dazzle the investor to forget the unstable nature of all such properties, more especially if the attention of the management is to be distracted with internal dissensions. St. John del Rey lower, at 3½, though this includes the dividend at 17½ per cent. to be declared at the meeting on June 28. The produce of Don Pedro for May is 15,000 oltas. Bird-eye Creek are at 15s. Eberhardt, 7½. Emma, 2s. 6d. Flaystaff, 13s. 6d. Frontino, 35s. Javali, 6s. to 8s. Pestarena United, 4s. to 5s. Rosca Grande, 2s. 6d. South Aurora, 2s. 6d. to 5s. United Mexican, 65s.

Shares of oil companies are very firm. Dalmeny, 5s. higher. Young's Paraffin in request on the approaching meeting to-morrow. Uphall are now quoted ex div., and, sharp as the rise has already been on these shares, competent judges look for them being 10 before long.

In shares of miscellaneous companies there have been few transactions. Cheshire Amalgamated Salt at 9 to 11. Hopkins, Gilkes, and Co., 9½ d. Miner's Safe, 8½. New comberro Phosphate, 6½. Starbuck Wagon, 13. Scottish Wagon (new), 30s. to 32s. 6d. Chemical companies' shares are generally firm, excepting Lw's, which are easier at 7½ to 8½; ditto, 7 per cent. (pref.), unaltered; Langdale's, 99s. 9d.; and Newcastle, 3s. to 25s.

HALKYN DISTRICT DRAINAGE COMPANY.—This undertaking, of which the Duke of Westminster is Chairman, is proceeding most satisfactorily with the driving of the tunnel at an average of 50 yards per month. It is now on a well-known cross-course, and at any time the drainage may be effected of some or all of the various mines. This will cause a great rise in the Drainage Company's shares, as its royalties do not depend upon the market price of the claim or ore, but, as fixed by Act of Parliament, are 2s. 10s. per ton on all ores raised from mines drained by its operation in a certain area, and 12s. 10s. outside of that area. Owing to the early prospects of this scheme being a success Rhosmor shares are being well held, for judging by the mine's former richness they would be able to pay handsome dividends at once, and most of the valuable machinery erected on the mine

from time to time could also be realised and treated as profit. Rhyl Alyn is another of the first mines that will be unwatered under this scheme, and enable the proprietors to open out increased wealth, for it has already yielded about 400 tons of lead ore per month. They got 16 tons last month from a new lode above the water level, and 12 tons were sold. This was in the western portion of the sett, and reserves are being rapidly opened up. In the eastern portion every fresh run met with is richer than the last. This mine has decided to come under the Limited Liability Acts, and is being privately registered.

LEADHILLS SILVER-LEAD MINING AND SMELTING COMPANY (Limited).—The development of this company's mines is being vigorously carried out, and several important points are now being proved. The price of lead is very much against them, and the ore raised is being held for a better price, which it is to be hoped the more promising appearance of politics will bring about. In regard to the gold portion of the property, it is expected to yield some measure of success, as the ancients took half a million sterling out of it. A dividend of 3s. per share has already been paid for the current half-year, and further dividends depend on the result of the sales of lead.

The following calculations show the yield per cent. on money invested at present prices in the shares named, based upon the last average yearly dividends, being maintained:—In iron and coal companies Andrew Knowles and Sons would pay 14½; Bolckow, Vaughan, A. 5½; ditto, B. 5½. O. Cammell and Co., 8½; ditto, 6 per cent. debentures, 5½; ditto, 5 per cent. debentures, 4½. John Brown and Co., 8½; ditto, 5 per cent. (pref.), 5. Parkgate, 3½. Sheppridge, 7; ditto, (new), 6½. Staveley, A. 6; ditto, B. 5½; ditto, C. 6; ditto, D. 5½; and ditto, 5 per cent. (pref.), 4½. In wagon companies Birmingham would pay 8½; British, 8½; Metropolitan, 9½; Midland, 6; North Central, 7½. Sheffield, 7½; ditto, 6 per cent. (pref.), 6; and Yorkshire, C. 7½. Great Laxey Mine would pay 10, and St. John del Rey 11½. In miscellaneous investments Earle's Shipbuilding may be mentioned to pay 7. Lw's Chemical, 7 per cent. (pref.) minimum, 7. Liverpool of Rubber, 7½; Miller's Safe, 5½; and Unicorn Soap and Alkali, 3½.

THE OLD GROSVENOR MINE.—Since last report the lode in the eastern shaft has much improved, being now worth 12 cwt. per fathom, and consisting of white limestone mixed with black fossils, carbonate of lime, and yellow clay, mixed with lead ore. From these pretty reliable indications the probability is that a good run of ore is not far off. Fair progress is being made in sinking the shaft, owing to the ground continuing very easy.

On contango day (Tuesday) the following were the rates of continuation current:—Contango: 1d. on Glasgow Caradon, 1d. on Port Washington, 1d. on Huntington, 1d. on Monkland Iron, 7½d. on Richmond; even 3d., 4½d., 3d. on Uphall Oil; 6d., 9d. on Young's Paraffin.—Backwardations: 6d., 3d. on Tharsis. On comparing the making up prices fixed to-day for the shares mentioned with those of the previous settlement, the variations shown for the account are as under, and show the decided return of confidence that has set in amongst investors. Richmond has advanced 3d. per share, Uphall Oil 12. 7s. 6d., Tharsis (new) 17s. 6d., Tharsis and Young's Paraffin each 11s. 3d., Omoa and Cleland 4s. 6d., Oakbank Oil 4s., also Glasgow Caradon and Monkland Iron each 2s. 6d. In no case has there been any fall, but Canadian Copper, Port Washington, Huntington, and Marbella show no alteration.

Subjoined are this week's quotations, &c., of mining and metal shares quoted on the Scotch Stock Exchanges:—

Per share.	Paid up.	Previous.	Last.	Description of shares.	Last price.
£ 10	28	£ 7	—	Arncliffe Coal (Limited)	7
10	10	4	—	Benhar Coal (Limited)	51 16s 3d
100	50	22s 6d	31s 6d	Bolckow, Vaughan, and Co. (Lim.)	5 ½
10	10	10	10	Cairn-table Gas Coal (Limited)	8
10	10	10	10	Chillington Iron (Limited)	60s.
23	20	10s 10d	10s 10d	Ebbw Vale Steel, Iron, and Coal (Lim.)	7
10	10	10	10	Effe Coal (Limited)	70
10	10	10	10	Glasgow Port Washington Iron & Coal (L)	35s.
10	10	10	10	Ditto Prepaid	40s.
10	10	10	10	Lochore and Capleirae (Limited)	80s.
10	10	10	10	Marbella Iron Ore (Limited)	37s. 6d.
10	10	10	10	Monkland Iron and Coal (Limited)	60s.
10	10	10	10	Ditto Guaranteed Preference	19
100	100	10	10	Nant-y-Glo & Blaenau Ironworks pref. (L)	12s.
6	6	10	10	Omoa and Cleland Iron & Coal (L & Red.)	35s.
1	1	15	15	Scottish Australian Mining (Limited)	15s.
1	1	15	15	Ditto New	91
Stock	100	10	10	Shotts Iron	91
COPPER, SULPHUR, TIN.					
4	4	—	—	Canadian Copper and Sulphur (Lim.)	4s.
10	7	57½	55	Cape Copper (Limited)	31d.
1	1	7½	7½	Glasgow Caradon Copper Mining (Lim.)	22s. 6d.
1	1	15s.	7½	Ditto New	15s.
10	9½	—	—	Huntington Copper and Sulphur (Lim.)	33s. 6d.
25s.	23s.	—	—	Kavunda Mining (Limited)	1s.
4	4	—	—	Panulicillo Copper (Limited)	20s.
10	10	10	10	Rio Tinto (Limited)	82s. 6d.
200	20	7	7	Ditto 7 per cent. Mortgage Bonds	15½
100	100	5	5	Do. 5 p.c. Mor. Deb. (Sp. Con. Bds.)	64½
10	10	10	10	Tharsis Copper and Sulphur (Limited)	22½
10	10	7	7	Ditto New	16½
1	1	1	1	Yorke Peninsula Mining (Limited)	5s.
1	1	1	1	Ditto 15 per cent. Guaranteed Pref.	20s.
GOLD, SILVER.					
1	1	—	—	Australian Mines Investment (Limited)	8s.
5	5	7s. 6d	7s. 6d	Richmond Mining (Limited)	12
OIL.					
10	7	6	15	Dalmeny Oil (Limited)	8
1	1	7½	25	Oakbank Oil (Limited)	42s. 6d.
1	1	5s.	25	Ditto	12s.
10	10	7½	2	Uphall Mineral Oil (Limited) "A"	81 16s 3d
10	10	10	10	Ditto "B" Deferred	15s.
10	10	10	10	West Calder Oil (Limited)	40s.
10	8½	9	17½	Young's Paraffin Light & Mineral Oil (L)	16
MISCELLANEOUS.					
80	25	5	6	London and Glasgow Engineering & Iron Shipbuilding (Limited)	24½
7	7	10	15	Phospho Guano (Limited)	8½
10	10	6	6	Scottish Wagon (Limited)	11
10	4	4	6	Ditto New	82s. 6d.
Interim. Per share.					

NOTE.—The above lists of mines and auxiliary associations are as full as can be ascertained, Scotch companies only being inserted, or those in which Scotch investors are interested. In the event of any being omitted, and parties desiring a quotation for them and such information as can be ascertained from time to time to be inserted in these lists, they will be good enough to communicate the name of the company, with any other particulars as full as possible.

J. GRANT MACLEAN, Stock and Share Broker.
Post Office Buildings, Stirling, June 13.

FOREIGN MINING AND METALLURGY.

Some orders for re-assortments have been received by the iron trade of the Haute-Marne. Some orders of a certain importance have also come to hand for good qualities of iron; inferior iron and rails have remained neglected. Work has been tolerably well sustained in most of the foundries. In the Loire-et-Rhone group the iron trade has presented scarcely any new feature. Transactions have continued to present comparatively little importance, and have been upon quite a restricted scale. The convention of navigation concluded June 13, 1862, between France and Italy, and the treaty of commerce concluded Jan. 17, 1863, between France and Italy, have been extended by mutual consent until July 1, 1878.

The Belgian coal trade will, it appears probable, have to enforce a reduction in the number of working hours if it does not wish to see stocks accumulate. This is due to the continued stagnation of the Belgian iron trade and the little confidence which appears to be still felt in the future. At the same time, the fact is officially indicated that during the first four months of this year the exports of coal from Belgium increased to the extent of about 150,000 tons. The Belgian Consul at Konigsberg reports that Belgium forwarded last year 5000 tons of coal to that German port. Belgian colliery proprietors are thus clearly making great efforts to develop new outlets for their products, but notwithstanding this prices do not revive, and to give them more firmness it appears necessary that a reduction in working hours should be made. The Marcinelle Coal Azglomerates Company has offered to supply the Belgian Administration of the Marine with lots of agglomerates at 14s. per ton; deliveries to be made in the second half of 1878. The Civil Hospital at Louvain has let a contract for 230 tons of coal at 14s. 6d. per ton; the highest tender delivered was 15s. 3d. per ton.

The Belgian iron trade presents the same feebleness in prices, and the same sluggishness in transactions. Official returns which have just appeared show that the quantity of rough pig and old iron imported into Belgium in the first four months of 1878 was larger than the corresponding imports in the corresponding period of 1877. The export of rails from Belgium presented, however, a notable falling off in the first four months of this year. The imports of iron minerals and limalles into Belgium have also increased in the first four months of this year. The same remark applies to rough pig and old iron. The exports of iron minerals and limalles from Belgium in the first four months of this year presented some augmentation as compared with the corresponding period of 1877. M. Schneider, of the Creusot Works, contended recently before a French

Commission of Enquiry that although England, Belgium, and Germany were countries which preached free trade they rejected in practice the application of free trade principles. So far as Belgium is concerned, Belgian writers deny that this is the case, since in 1866 two lots of locomotives were ordered from the Creusot Works. In July, 1873, and August, 1874, contracts for rails for the Belgian State Railways were also let to German firms because they presented tenders at rates lower than those asked by Creusot. The Belgian Government has just received from Krupp, of Essen, four complete campaign batteries of artillery. This order has given some offence to Belgian industrialists, who allege that excellent steel cannon can be made in Belgium. Its old contracts are about to be let for the ironwork required for two bridges of no great importance about to be thrown over the Vesdre, at Prayon and Traipont; the cost of the iron to be thus supplied is estimated at 234M. The Thy-le-Chateau Blast Furnaces and Forges Company will pay on July 1 a dividend for 1877 at the rate of 5 per cent. per annum. The administration of the Belgian State Railways has announced that certain special tariffs which have been for some time in force for the conveyance of iron minerals, pig, rough steel in bars, &c., from certain points in Germany to Belgium, will be discontinued from July 1, 1878.

It is announced that Krupp, of Essen, is about to construct a pile hammer with a fall of 13 ft. 4 in., and weighing altogether 240 tons. Since the commencement of the prolonged depression in the German iron trade in April, 1873, it is computed that 37,000 workmen have been discharged from German ironworks. Wages have also been reduced in the German iron trade during the last five years to the extent of 16 per cent. Both the old established and the newly established ironworks of Germany appear to have met with losses since April, 1873, but the old established mechanical establishments have suffered less than their new competitors.

THE MINING LAWS OF NORWAY.

The international Statistics of Mines and Smelting Works, published at St. Petersburg (Trenke and Fusnot), to which reference has already been made in the Journal, contains an interesting sketch of Norwegian mine legislation. It appears that the working of mines, which in Norway dates from the 16th century, was first regulated by law in 1539, which introduced the German system of vesting all metaliferous minerals in the State. Desiring to encourage private industry to the utmost, the Government in 1632 declared the working of mines absolutely free, the proprietor of the soil having no preference over any other person. This fundamental principle forms the basis of present legislation (the law of 1812 and those supplemental to it). The silver mines of King-berg are the only ones carried on by the State; these are administered by three members nominated by the Minister of Finance. Quarries, and all non-metaliferous minerals, as well as bog iron ores, belong exclusively to the proprietor of the soil. Pits cannot be sunk, however, in cultivated lands without the consent of the proprietors, nor at a distance of less than 63 metres from any house. A Government concession is necessary for smelting works when the wood used for fuel is taken from forests not belonging to the owner of the works. In other cases, as when mineral fuel is used, the working is entirely free.

The mode of obtaining concessions in Norway is extremely simple. When the discoverer of a mineral deposit wishes to explore it makes a declaration in duplicate before a magistrate, one is sent to the Government Inspector of the district, the other is kept by the proprietor of the works, and by him published as soon as possible. At the end of 18 months from this declaration the applicant formally demands a concession (if such it may be called, seeing that the inspector has no power to refuse). The inspector determines the perimeter of the mine, which is limited to 9000 square metres, or a length of 280 metres, by a width of 63 metres on each side of the vein. The surveillance of the mines is entrusted to the Minister of the Interior, and the Government inspectors and mining engineers are bound to visit once at least in each year all the mines being worked in their respective districts.

CORSICAN AND ALGERIAN COPPER ORES.

In the mining department of the Italian section we have seen some remarkable specimens of copper ore; those of Monte Cattini occupy, of course, the most prominent rank, and are of exceptional richness. Next to them come those of the Terricio Mining Company (Limited), which is in full working order, whilst the Monte Cattini mines are almost exhausted. This Terricio Mining Company has a history which is rather instructive. These copper mines are situated in the large estate of Prince Poniatowski, and contain ores of the highest percentage. It was in vain, however, that they were offered to English capitalists two years ago. Nobody would touch them. English people are always disposed to invest money in grandiose affairs, like the Rio Tinto Company, for instance, which turns out only very poor pyrites, and requires an immense capital for its working; but they are cautious as soon as the affair is not proposed through the medium of bankers or by financiers. After many fruitless attempts to raise in London the modest capital necessary for the Terricio estates and copper mines the promoters of the company went to Paris, and at once found gentlemen ready to supply the money. Now, the Terricio estates are an admirably rich agricultural exploitation, and their mines produce large quantities of ores of which the percentage is very high, and which are almost without exception exported from Italy to England. English merchants buy copper ore, whence they can at any time extract the metal themselves at a large profit. The samples of the Terricio copper ores deserve the attention of the visitor to the Italian section; there are to be seen all sorts of pyrites, the khalozinc, native copper, and above all magnificent samples of philipsite.

English manufacturers must not lose sight of the fact that the copper mines of Italy, Algeria, and Corsica are the richest known, and can be worked with the greatest advantage and the smallest cost. In an early issue we shall devote an article to the Algerian copper mines; but to-day, since we have spoken of Monte Cattini and Terricio, let us say a few words of the Ponte Leccia Mine, in Corsica, which is of the same geological formation as Monte Cattini, presents the same characteristic high percentage of ore, and above all other advantages contains that finest quality of the copper ore known under the name of philipsite. The following report on these mines by Prof. Ansted, F.R.S., will give an idea of their value.

Sir—I have visited the various works opened on the mining concession of Ponte Leccia, situated on and near the high-road from Bastia to Ajaccio in the Island of Corsica, and distant about 30 miles from the town and Port of Bastia, on the north-east, and the same distance from the small Port of Rousse, on the north-west. The whole of the concession is crossed by excellent roads, and there is abundant water power all the year round.

The concession is traversed from north to south by continuous southward of the Great Champion Lode Lead ore, and purely worked in the St. Augustine concession in Corsica. Considerable quantities of rich copper ore of the kind called philipsite have been raised and sold from surface workings, especially from two points, and large quantities of copper pyrites have been found, partly in bands several inches thick, partly disseminated in quartz. On the back of the lode rich red and grey oxides and green and blue carbonates are everywhere found, and they are accompanied occasionally by native copper and black oxide.

The main lode runs for the distance of about 2 miles nearly parallel to the course of the River Asco, to its junction with the Golo, and then crosses the valley, and continues on the right bank of the Golo. From 15 to 20 vertical pits have been opened within this range, and the indications are everywhere exceedingly favourable. At one point an adit has been driven to cut the lode, and a small sink put down, the result being the discovery of a course of yellow copper ore of very good quality, and several inches in thickness.

No really important and regular mining operations have been carried on as yet in the district, and the lode has never been cut at a greater depth than a few fathoms. It would be very easy and inexpensive to drive two deep adits from the valley near the level of the river, which would cut the lode at the depth of 20 or 30 fms. and enable the ground to be fairly examined. Several hundred tons of very rich ore have been taken from deposits near the surface. These are chiefly from serpentine bands. The lode carries ore in all the rocks that it crosses, which include granite and clay slate as well as serpentine. The latter greatly resembles the rocks, yielding the rich ore of Monte Cattini, in Tuscany, and there is a deposit of gabbro rock often adhering to the ore in this deposit, as well as in that of the main lode in Italy opposite. In this part of the lode the conditions are almost precisely similar to those of St. Augustine.

Parallel to the main lode there are a number of branches more or less connected with it, but many of them at a considerable distance to the east. Some of these have been proved and are found to contain excellent stones of ore.

Besides these copper ores the concession is understood to cover pure deposits of

* "Ure's Dictionary of Arts, Manufactures, and Mines, containing a Clear Exposition of their Principles and Practices." By ROBERT HUNT, F.R.S., Keeper of the Mining Records. Vol. IV. Supplement. London: Longmans.

long papers on Iron Ores, Iron and Steel, Lignite, Manganese, and Mineral Oils, and a very interesting one on Nickel. The Dressing of Ores is very fully treated of, and there is an article on Rock-Boring by Mr. Darlington, which would, however, have been enhanced in value had not all but the writer's own invention and arrangements been virtually ignored; the treatment, however, is excusable, as an inventor cannot be expected to give prominence to the machinery of rivals. The Cranston, Ingersoll, and numerous other drills constantly noticed in the *Mining Journal*, which at the present time have almost the monopoly of the market, are not mentioned. There are articles on Silk, Silver, the Utilisation of Blast-Furnace Slag. The Telephone is described, but the Phonograph is merely mentioned incidentally; yet, upon the whole, a large amount of valuable information has been brought together, which, with the previous volumes, will render the work very complete.

LEAD MINING IN DERBYSHIRE.

Many changes have taken place in lead mining in Derbyshire during the last decade, so that the returns of one year contrast in a most marked manner with those which either preceded or followed it. Water has been a serious drawback to operations in nearly every district, whilst the peculiar laws relating to the opening of the ground in prospecting for lead ore from their simplicity and the encouragement they give to men without capital to enter upon another's property without leave or licence has not had the effect that might have been expected. Sinkings have been made, but only to be abandoned, owing to a want of capital to go down to certain depths, or from an influx of water, for which there was no machinery to carry off. Lessees and those holding under them, unlike some other lead mining counties, have not extolled the value of certain properties by means of reports and highly-coloured prospectuses, and the consequence has been that capital has not been invested in the lead mines of Derbyshire to anything like the extent that might have been expected. This is all the more surprising, seeing that ore can be sought for in nearly all places without let or hindrance, for we are told by the "Mineral Articles" that it is lawful "for all the subjects in this realm to search for, sink, and dig mines or veins of lead ore, upon, in, or under all manner of lands of whose inheritance soever they may be (churches, churchyards, places for public worship, dwelling-houses, burial grounds, orchards, gardens, pleasure grounds, and highways excepted)." To most people such a law would be considered as carrying a privilege a long way too far, seeing that it directly interferes with the rights of private property, and so carries out the principle of the liberty of the subject on one side only. But even such a free-and-easy system does not appear to have worked at all well, and in all probability has been most injurious to many men who without capital have "tried their luck" in digging on other people's land only to be disappointed at the results. Of this we had ample evidence during a visit we recently paid to the lead districts of Derbyshire. In the midst of the most charming scenery we saw many places where the ground had been broken, lead found, but not in sufficient quantities to pay, and then abandoned. This has been fully borne out by the yearly returns made, for we find that in 1875 there were 28 mines in the county that produced during the year less than 1 ton of ore; 53 yielded above 1 ton; and only five gave above 100 tons of ore. During the last and the present year, however, matters have been looking better, but only at a few places, where there is plenty of machinery and the owners are capitalists. Most of the small concerns have been closed, and the few that are being worked are anything but profitable, whilst one mine alone now raises more ore than all the others put together. But there is very little doubt but what there are large reserves of ore that would well repay capitalists for opening out, even with the present low price of ore.

Derbyshire is, undoubtedly, the oldest lead mining county in the kingdom, for the ore was worked in the old Roman town of Wirksworth, in the time of HADRIAN, and after him by the Saxons, and in the Moot Hall is still preserved the "Miners' Standard Dish" presented by HENRY VIII. The QUEEN, in right of her Duchy of Lancaster, is seised of and in the manor and wapentake of Wirksworth, and of the lead mines in what is termed the King's Field; and, by the Act of 1852, PETER ARKWRIGHT, Esq., was appointed lessee of the lead duties, whilst the Duke of DEVONSHIRE, Duke of BUCKINGHAM, Duke of RUTLAND, the Earl of THANET, Lord SCARSDALE, and others are entitled to the mineral duties in certain manors or liberties, of which they are tenants for life. These duties cannot be very large, we should say, seeing that so few mines are being worked, whilst the lessees do not care to become mineowners themselves. Were they to do so probably Derbyshire would hold a higher position than it does at present as a lead-producing county, for mining operations cannot be successfully carried out excepting by those who have plenty of capital to provide the best machinery and appliances for pumping and other purposes. Hence it is that lead mining in the county is in such a few hands, whilst we believe there is only one gentleman who is actually doing a good and healthy business—and that is Mr. WASS, the owner of the Milleclose and several other mines.

The Milleclose Mine is the finest in Derbyshire, is situated about a mile from Darley, and four from Matlock Bath. The mine was closed for some time, owing to the great quantity of water; but Mr. WASS put down some very powerful machinery and plant, at a cost of something approaching 20,000*l*, and work was resumed some eight or nine months ago. There are several engines on the bank—one of them being an 80-in. cylinder, 10-ft. stroke, with 35-ton beam, by HARVEY and Co., Hayle, Cornwall. The motive-power is obtained by means of four double-flued boilers, by GALLOWAY and SONS, of Manchester, and one single-flued boiler; the lifts being capable of drawing out more than 2000 gallons of water per minute. There is another engine—a 50-in. cylinder—besides two for drawing purposes, and a capstan engine. The shafts are of a moderate size and depth, whilst there are the usual dressing appliances, stores, &c. The mine is by far the finest in Derbyshire, and the output is now at the rate of upwards of 200 tons per month, being considerably more than is raised at all the other mines in the county. The ore too is of excellent quality, giving from 75 to 80 per cent. of lead. After washing and dressing the ore is taken direct to the Lea Lead-works, near Matlock, Bath, where it is smelted by Mr. WASS, who thus has the whole of the work in his own hands. The area of mineralised ground in connection with the mine is large, so that there are very extensive and rich reserves to be worked. The ore, it may be said, is very easily worked by comparatively few hands, for several veins appear to meet together, so that large bunches are taken out without difficulty. Whilst visiting the mine we met with Mr. WASS, who most courteously showed us over the place, and also gave us his views as to the future of lead mining in the county. His own mines, we may say, have all the necessary machinery that can be required, and it is to this fact, we believe, that his success may be attributed. Without capital mining in Derbyshire cannot be pursued to a successful issue, and this has been replied to the full extent by a large number of persons who have tried what could be done with small means, and, in some instances, with no means at all.

In most other districts the business doing is very moderate indeed, and several places have been stopped, owing to being troubled with too much water. At Crich the Wakebridge Mine, belonging to Mr. WASS, has been doing tolerably well, and raising, we believe, about 70 tons of ore a month, which has a healthy appearance. In the neighbourhood of Winster, one of the oldest market towns in the county, there are several lead mines; but for some time past very little has been doing at them, although some good ore has been raised at Elton Cross, Heyspots, and Pitts. Eyam has long been noted for its mines and their peculiar situation, and there is at least one company that we were given to understand still works the ore, although not at present to the profit of the shareholders, although last year the Eyam Mine raised lead to the value of 3400*l*. The Milledam Mining Company, at Great Hucklow, are raising lead, but the quantity is scarcely sufficient, we should say, at present at least, to pay a dividend. Like many other mines, the well-known Magpie has been suffering from a surfeit of water—a complaint that has been fatal to a good many similar works, but we were informed that they are now driving an adit and put-

ting down a 70-in. cylinder engine, so as to get clear of their enemy, and resume working operations. No doubt, as we have before stated, there are other good mines that have been abandoned because the parties working them were unable to find the capital to pay for the necessary pumping and drawing machinery, and it is to some of these that attention should be directed by capitalists who desire to invest in the lead mines of Derbyshire. In the Bradwell, Cromford, Middleton, &c., and Bonsall and other districts some mines are at work, but they are not doing much, and, judging from appearances and what they are doing, it is rather difficult to say how they are made to pay even ordinary expenses.

A walk of about three miles from Matlock Bath, and up a steep hill, brings one close to the town of Wirksworth, and standing on the summit the remains of many lead mines can be seen that at one time were full of life and activity, bringing to the surface large quantities of rich ore. Some of the names, however, are significant enough as to the doubts of those who started them—for we have Milner's Venture, Mould's Venture, the Gall Mining Company, De-fiance, Chance, &c. These appear to have all passed into oblivion, and even the Grey Mare Mine has turned out a bad horse for its backers. One, or perhaps the best mine in the district, was the Bage, belonging to the Messrs. WASS, only a short distance from the town, and from it, in 1872, lead to the value of upwards of 4000*l*. was extracted, but now we believe it is standing. We were, however, informed by Mr. WASS that he was engaged in making some searches under the town itself, and if these were successful then operations in all probability would be resumed; but, on the other hand, if the results were contrary, then most likely the district would be entirely deserted so far as lead mining was concerned.

In conclusion, we may say that there are various reasons for the depression which has so long existed in connection with lead mining in Derbyshire, not the least of these being the vast bodies of water that have to be overcome, and the limited capital at the command of those who have opened out mines. Success, as in the case we have alluded to at the Milleclose, is only to be obtained by those who are in a position to put down sufficient engine-power and machinery to overcome water and everything else, so that true economy in working and the making of profit in the carrying on of lead mines simply means plenty of cash at command. With such we have no doubt but what there are plenty of abandoned mines in Derbyshire that could be made to pay well.

GOVERNMENT INSPECTION OF MINES.

MR. ALEXANDER'S REPORT.

The year now gone has not been marked by any unusual disaster, and the depressed state of trade has marked by the expansion of mining enterprise throughout the coal field generally. From a commercial point of view, the mining industry of the country cannot be said to be in a flourishing condition, and the prices, unless in favoured localities, do not bear leave a large margin of profit for the producer. The use of coal, now the great alient of industry, is constantly extending, and notwithstanding the backward state of trade the mining products of the district as compared with 1876 has been but slightly affected. Notwithstanding the general anxiety to diminish the casualties incidental to those who work in and about mines, the success has not yet been so great as could be desired. To carry out such work without accidents is apparently impossible, to mitigate, or reach a standard attained by the most advanced and best managed district, is all that the most sanguine can expect to realise.

One of the casualties referred to by Mr. Alexander is an externally-fired cylindrical boiler explosion at Cowie Colliery, near Stirling, and with regard to this Mr. McColl, engineer, of Glasgow, who was directed by the Procurator Fiscal to report upon it, suggests, after giving the details, that "the loss of life and property through the explosion of this class of boiler may be greatly reduced by tying the two ends of the boiler together by means of a strong longitudinal stay running through the boiler from one end to the other and firmly secured. While this would probably have little effect in preventing the explosion itself it would, by preventing the two ends of the boiler from flying apart, greatly reduce the possible amount of damage."

It would perhaps be difficult to define in how far Government interference has tended to better the condition of those who work in mines. It is manifest, however, that notwithstanding the increased dangers to which all are exposed, from operations becoming more complicated and extensive, that the average loss of life has been reduced. If it could be equally satisfactorily proved that owing to the improved condition of the mine men are now capable of continuing their labour to a more advanced age, something definite could be pointed to as having been accomplished. Statistics, when carefully compared, will, he is persuaded, clearly prove that this is so, and that the average age to which underground workmen are capable of continuing their labour has gradually lengthened since the passing of the first Mines Regulation Act.

MR. MOORE'S REPORT.

During the past year the mining industry has been in a most depressed state, and fewer coals were sold than in 1876. Many of the new collieries which were projected during the period when high prices prevailed in 1871-2-3 have now been sunk, and are turning out large quantities of coal notwithstanding this dull trade. The result is that many of the older collieries have had to give way, and prices, in the competition for trade, have been reduced to the lowest point. Miners' wages were reduced in some instances, but not to any great extent. The nominal wage in the sale collieries of Lanarkshire was from 4s. 6d. to 5s. per day. He is enabled to give the rates paid per ton during the year for the same amount of work, and this will give a fair idea of the state of matters. In the counties of Fife and Clackmannan, where the output is about one-sixth of the whole district, there was a strike and lock-out which lasted 15 weeks, and the output was only 1,566,124 tons in 1877, against 3,025,655 tons in 1876.

Mining operations, especially in Lanarkshire, are assuming such proportions that only the best management and discipline will enable them to be carried on with safety. It is much to be regretted that the miners so seldom assist the owners in securing the safety of the mine, as far as that can be done by examinations in terms of the 30th general rule. One excuse is the expense, but he would recommend its being done even if the masters had to bear it. It must be kept in mind, however, that a miner's examination such as is meant by the 30th general rule can only refer to facts or to opinions such as are to be expected from a workman, and that any scientific opinion as to the value of the mode of ventilation and working must be given by the manager or by a competent person. In matters of this kind the opinion is of no value, and the owner, agent, and manager must rely on their own judgment and observation. He thinks periodical examinations—say, monthly or quarterly, and independent of the manager's supervision—by skilled persons at least of the grade of a certificated manager, would be attended with benefit; and he feels certain that for a small sum yearly a regular examination could be made which would be beneficial both in point of safety and economy.

MR. WARDELL'S REPORT.

Whilst thankful that the loss of life from explosion forms so inconsiderable a part of this year's total, still there remain the same cautions, advice, and warnings to be impressed upon all for guidance in the future, and the same lessons to be drawn from what has happened in the past. All these must be borne in mind, and the recommendations repeated, even at the risk of tedious reiteration, in order to endeavour, so far as possible, to reduce the rate of mortality to one even still lower in years to come. When it is considered of how large an area this district consists, and that it embraces within it some of the most fiery mines in the kingdom, mines, too, many of them of vast extent, with many miles of old workings, and in which eruptions of gas, at a pressure which it is hardly within our intelligence to comprehend, from time to time occur, the number of deaths from this source of danger is certainly to be regarded as favourable, and progress is surely here appreciable. That explosions, when they do occur in the Barasilly and Silkestone seams, are sometimes of such gravity is due in some measure, he believes, to the dry character of the mines. There is a large amount of dust collected, and when an explosion of gas takes place it scatters and ignites this dust all over the pit, making a two-fold disaster, as it were, and causing as much or, perhaps, more injury by the whirlwind of red hot dust as by the actual firing of the gas itself, and thus being sometimes drawn and attracted over a large portion of the workings, affecting an area which might otherwise have been localised by the actual amount of the gas. Then again, where very large goaves exist, with imperfectly ventilated cavities in the roof, gas, from its lightness, accumulates there, and these places form a kind of train of reservoirs, and are all gathered into an explosion such as he has described.

The educational requirements of the Act have been observed in the past year; further he has no cause to mention where the clauses specifying the age at which boys are to be employed were infringed. This is satisfactory when the number of mines where young boys are employed in this district is taken into consideration. Under certain clauses of the Act boys under the age of 13 receive an exemption from the Secretary of State, at his discretion, according to circumstances, which enables them to be employed underground. This is of material importance in parts of this district where the seams worked are so thin that otherwise it seems probable they would have to be abandoned altogether. Still he is glad to perceive that so far the number of these gradually diminishes; 374 boys of this age were employed last year, as compared with 568 the previous year, or a reduction of 24. In 1875 the number was 637; in 1874, 615; and in 1875, 470. There are, therefore, at the present time 463 fewer boys of this age employed underground than there were five years ago. There were in 1876 5 females between the ages of 10 and 18 employed aboveground, 6 between 13 and 16, and 13 above 16, or 24 altogether. In the year under report there are none between 10 and 13, 2 between 13 and 16, and 14 above 16, or a total of 16. The total number of persons under the age of 16 employed at the mines in Yorkshire and Lincolnshire above and below ground he finds to be 866 out of a gross total of 60,777 persons employed, or nearly one-seventh; and referring to the list of deaths, the proportion killed, aged 16 and under, is 12 out of a total of 167, or about one-ninth. The number of collieries in

this district is less by six than in 1876; yet, though the number of persons is also reduced, the output of mineral is considerably increased. The fact that the number of collieries has decreased does not signify that there have been no new undertakings commenced; there have been several, and many at the present time are in process of being opened out, but a large number of small collieries have been closed, more than counterbalancing any increase which would otherwise have been apparent.

MR. WILLIS'S REPORT.

Referring to an explosion at Allhallows Colliery, Cumberland, Mr. Willis reports that on the morning of the accident one witness admitted having seen gas and "batted" it away; this was at the top end of the working face. There was a conflict of evidence as to how, if ever, this had been reported to any superior official. Ten minutes before the explosion the manager himself had been along the "face" and he said he did not see any signs of gas, but he cannot help thinking, however careful his examination had been in other respects, it was not efficient in this. At this time three shots were close upon ready for firing, the shot first was brought, he examined a distance of one or two yards on each side of the first shot, which was at the dip end of the face, and then lit it up. This shot caused the explosion. It was very wrong to allow the ventilation of a district such as this to depend upon bratticing. It had, however, been given off for some time, but in very small quantities. It had, however, come to be given off in greater quantity than could be sufficiently diluted by the feeble current of air which must have prevailed. The examination before firing the shot, if made at all, was not sufficiently extended, especially as it was known that gas at the high end of the face had to be "batted" out on that morning. There was an absence of instructions and regulations as to whom and by whom, and how accumulations of gas when discovered had to be reported, each officer apparently working by himself, and if he found gas and could get it removed, leaving the matter resting there.

Two frightful (in their results) explosions of dynamite are recorded; in one case two men lost their lives, and in the other one. As might have been expected, and as is usual in such cases, not a trace of anything except the shattered fragments of the poor fellows' bodies was left to throw any light on the causes of the accidents. In his enquiries relative to these two accidents, and in his general enquiries as to the use of dynamite, he found a bad practice prevailing—the supply of dynamite and the detonating caps used with it were generally kept in the same box provided for the purpose. Separate boxes are now used, and it is expected, he kept at a good distance apart. It also came to his knowledge that in using dynamite in wet ground it was not an unusual practice for the men to draw the end of the fuse through the tailow of their candles whilst the candle was alight, before inserting it into the detonating cap. This was to prevent any possible venting of the end of the fuse. The proper method of doing this is, after the fuse has been inserted in the cap, to carefully nip it all round with pincers provided for the purpose. The following process is perhaps handier for the workman, but in performing it there is a possibility of the fuse becoming ignited and throwing off sparks, and these if coming in contact with the caps (in the box for instance) would be sufficient to account for the explosion of the dynamite. He is strongly of opinion that this was the explanation of the accident at Ehen Mine. At the same time it is right to say this is only conjecture; there was no evidence to this effect.

IMPROVEMENTS IN PUMPS.

The economic raising of water being of great importance in connection with a large number of industrial operations, inventors have constantly turned their attention to the subject, and among the more recent inventions is that of Mr. GEORGE PINNINGTON, of Chester, which consists essentially in using in place of the piston, plunger, or bucket at present in use a coil or coils of flexible tubing, the said coil or coils of flexible tubing being alternately coiled and uncoiled on and off a drum barrel or the like, fixed within a closed pump head or its equivalent. The construction of a single-action pump may be described by way of example. To a tube or shaft provided with a valve opening upwards he attaches an air-tight head or box, within which is a drum or barrel caused to revolve by means of a shaft or its equivalent passing through the pump head or box. Around the said drum or barrel is coiled a length of flexible tubing, one end of which, fitted with metal or other rigid tubular end, passes out through a stuffing-box in a line with the longitudinal axis of the drum or barrel, so that such end shall rotate with the drum or barrel. The other end of the tube passes through a second stuffing-box placed at, or nearly at, right angles to the longitudinal axis of the said drum or barrel, and is free to slide through the said stuffing-box. Instead of employing a stuffing-box, a head of water may be kept over the opening through which the coil passes, and so form a water packing. Both ends of the tube are open to the atmosphere. Coils of wire or like means are employed to keep the flexible tubing distended. The head or box is fitted with an outlet provided with a valve.

From this description it will be evident that when the flexible tube is caused to uncoil from off the drum or barrel a vacuum will be formed within the head or box, and liquid will ascend through the pipe or shaft past the valve into the head, and will fill the space before occupied by the flexible tube. When the tube is again coiled on the drum or barrel the liquid will be forced out past the outlet valve. In constructing a double-action pump according to this invention, two heads or boxes are employed, and the flexible tube is coiled on the drum or barrel in each head or box that when motion is given to the said drums or barrels one tube is being coiled, whilst the other is being uncoiled. The two ends, which pass out of the heads or boxes in a line with the axis of the drums or barrels, may be connected together when they are in the same straight line, as also may be the drum shafts. To ensure that that portion of the flexible tube which enters and leaves the head or box during coiling and uncoiling shall lay properly on the drum or barrel, or occupy the desired position, so as freely to pass through the stuffing box or gland, a longitudinal motion is given to the drum or barrel during its revolution, or a sliding motion is given to the stuffing box or gland through which the flexible tube passes. Further means for causing the flexible tube to take the necessary position on the drum or barrel consists of an endless band or bands of canvas or other material placed at the required distance from the drum or barrel, and is caused to travel by contact with the flexible tubing during coiling and uncoiling.

SLAG WOOL.—Although slag wool is a non-conductor of heat, sound, and electricity, and also incombustible, it has not yet been used for many technical purposes on account of its giving rise to the emission of free sulphur, ether, and hydrogen, and filling the air with fine penetrating dust. The invention recently patented by Mr. CHARLES BAATSCH, of Newcastle-street, does away with these objections, and slag wool prepared according to his invention will neither dust nor emit sulphuretted hydrogen, even when brought into contact with acids. In preparing slag wool according to his invention, he first forms it into pads or bricks, according to the use the slag wool is destined for. For this purpose he uses perforated moulds made of any suitable material, such as wirework, perforated metal, or wood. After evenly filling the moulds he dips them in diluted alkaline silicate of about 1.05 to 1.15. The moulds are then emptied and again filled, and the bricks or pads so formed are exposed to the air for about a week, by which time they will become hard on the surfaces, or this hardening may be effected more expeditiously by drying the pads or bricks in hot air, which may or may not be mixed with carbonic acid. For certain purposes the moulds may be dispensed with, and the slag wool, where its surfaces are exposed to the air, may be painted over with the alkaline silicate. The invention is useful for many purposes; the slag wool so prepared may be used not only for lagging boilers, covering steam pipes and hot and cold water pipes, but also in dwelling-houses for stuffing floors and partitions to make them fire and sound proof. For these purposes it is the more specially adapted, as no vermin can live in it. When covering floors or roofs with slag wool, instead of employing bricks, he first lines or covers the floor or roof with cloth or paper well saturated with the liquid, and then applies the slag wool in its natural condition over this cloth or paper, and covers it with a similar coating of cloth or paper prepared as described. For covering steam boilers, steam pipes, hot and cold water pipes, and similar articles, he applies the raw slag wool direct on the surface to be covered, and then covers the surface of the coating of slag wool with cloth or paper saturated as described, over which may then be applied plaster of Paris in a powdered state.

NEW EXPLOSIVE.—Nobel has invented an explosive which is still stronger than dynamite. From its resemblance to calf's foot jelly he calls it jelly powder. It is one great defect of dynamite that when it is damped the nitro-glycerine separates from the absorbing earth. The jelly powder, which consists of 94 or 95 per cent. of nitro-glycerine, and 5 or 6 per cent. collodion cotton, is so mixed as to assume a gelatinous form, which is tough, but can be easily cut with knives or shears, and applied to cracks or holes. It is water-proof, acts in the same way as dynamite, but is at least 50 per cent. stronger. —*Foris, der Zeit.*

THE PATENT "DESIDERATUM" ROCK DRILL.



THE PATENT "DESIDERATUM" ROCK DRILL.

As rock-drilling machinery is now becoming so generally used in mining operations it is satisfactory to see that engineers, who give their attention to this class of machinery, are simplifying and improving it. Messrs. LE GROS, SHAW, CLARK, and CO., consulting and mining engineers, of 4, Queen-street place, London, and 13, Clare-street, Bristol, who have had considerable and varied experience in mining operations and railway tunnelling, are the manufacturers of a new and improved rock drill, called the "Desideratum," which has been patented by Mr. P. J. Le Gros of this firm, who was formerly with the "Ingersoll" Rock Drill Company. The "Desideratum" is, therefore, the result of thorough practical experience.

The above engraving is taken from a photograph, and represents the patent "Desideratum" rock drill mounted on a tripod stand, which is intended principally for open work; but for mining operations the machine is usually mounted on a pillar (perhaps more generally known as a stretcher bar), which is fitted with a strong adjusting screw, and which is made fast either from top to bottom or from side to side in small headings and shafts, whilst for large headings and tunnels several machines are mounted on a travelling car, with suitable projecting arms to carry the machines. Messrs. Le Gros, Shaw, Clark, and Co. also make a special shaft sinking frame, on which two or more machines can be fixed for sinking large shafts.

The principal features to be studied in rock drills are economy in first cost and in working, in having a machine which will be equally effective when boring in all classes of rock, and which is simple, compact, and light, so as to be easily moved about, adjusted, and worked by any ordinary miner or quarryman. It will be seen from the above illustration that the "Desideratum" rock drill is exceedingly light and compact, and at the same time strong and simple, being free from a multiplicity of working parts, it is economical in first cost and in working,—advantages which will go far to bring it into general favour. It will drill holes equally well in any position and at any angle in all kinds of rock, and the harder the rock the greater the advantage of the machine. The rotary motion of the tool can, simply by substituting one of the working parts of the machine, be changed into a slotting motion for slate and coal cutting. Several have now been working in various mines and other works for nearly twelve months, and appear to be giving very great satisfaction. With one boring machine worked on a pillar in a heading measuring about 5 feet by 6 feet 6 inches at the New Crick Heath Lead, Copper, and Calamine Mines, on the borders of Montgomery, driving has been done at the rate of eight yards per week in very hard mountain limestone, where the previous rate by hand labour was about one yard per week; but a still greater contrast is shown at the Golden Grove Lead Mines, in Flintshire, where one machine has been driving at the rate of nine yards per week, while the previous work by hand did not amount to one yard per week. These are important facts, and speak well for the machine. In each of these cases the drill is working at about 650 and 700 feet from the boiler, and is driven by one of Messrs. Le Gros, Shaw, Clark, and Co.'s patent "Desideratum" Air Compressors (also a new invention), particulars of which we will give in one of our next Journals.

WIRE TRAMWAYS.—Mr. R. S. FRASER, of Portman square, has invented a method of conveying loads up hill as well as down hill with ease, safety, and regularity, without injury to the carriage or load conveyed; also ensuring complete control over the traveller at any point of its issue. He generally employs for each line a single wire-rope fastened at supports at each terminus; the distance between the latter may be even a mile or more. When required two lines may be used at the same time—a loaded traveller moving one way whilst an empty one moves the other. The traveller consists of a saddle framing, fitted with wheels riding on a wire-rope. These wheels may be two, but by preference three or more, in number; their spindles work in some approved grease boxes, such as are used for railway carriage-wheel axles. There is also one or more wheels mounted in the traveller frame below the wire-rope, so that the latter may ride in the groove of said wheel or wheels, the spindle or spindles of which are also efficiently lubricated (say) by means of a grease axle-box or needle lubricators; the lower wheel is no always in action, but is applied for steadying the traveller in a high wind, which generally causes the wire-rope to vibrate, thus tending to cause the quickly running "traveller" to jump up and leave the wire-rope. He covers the traveller when required with a casing (say) of bright sheet copper, and at each end he arranges a plough or fender for pushing aside any branches or other objects that might hinder or obstruct the road. The sides of the traveller framing are below the wire-rope, connected by a bottom plate hinged to each side; one of the hinge bolts is removable. The load or loads are suspended from hooks or otherwise under the traveller. For transport-

ing loads of great length two or more travellers are connected together. The traveller is by means of suitable winding gear hauled up the ascending wire-rope, and the return or descending journey is accomplished by gravitation. The ascent is, where it is possible or convenient, arranged for the empty traveller, and the descent for the loaded traveller. The invention is applicable not only on the single traction-work principle, but also when gravitation, water, or steam on the endless rope traction principle is available; the winding gear would then be at the lower end station. Where steam is applied as the driving power he prefers to fix a vertical inverted engine to the platform framework above the winding gear. Where intermediate supports are required he provides an upper shunt-wire and lower fender-rail. The invention may, it is claimed, be applied for overhead passenger and goods traffic in streets and roads; the line wire is then supported on suitable brackets or pillars. The tram-car suspended therefrom may be steadied by pulleys on each side of a guide rail fixed against the pillars.

THE COAL TRADE.—According to the official accounts the value of coal, &c., exported in the five months ending May 31 was 2,890,812*l.*, and in the like period of the preceding year 3,024,463*l.*

CONSUMPTION OF COAL IN MINE ENGINES.—Mr. John Lean, in writing to the West Briton, replying to the letter of "Omicon" (published in the Journal of June 1), says—"In reference to the future of Cornwall let the calm and thoughtful who wish to know about the future ask Mr. T. S. Bolitho or Mr. J. M. Williams; these gentlemen are head and shoulders above all others in their power of gauging the future, and I think they will tell anyone who may be fortunate enough to obtain their opinions that unless economy in mechanical appliances—as in boring—is carried out in all its integrity the future will be one of serious evil to many mines. I do not think that it requires the sagacity of a Bolitho or a Williams to convince everyone connected with Cornish mining that all possible economy is necessary in its prosecution. But why particularise any two individuals as possessing all knowledge? Why should it be thought fortunate to obtain the opinion of Mr. Bolitho or Mr. Williams rather than that of all others? They are two gentlemen of the highest respectability, but does their prophetic glance extend farther or penetrate deeper into the dark and hidden recesses of futurity than that of any or all others? I trow not; and were 'Omicon' to ask them their reply would be 'No.' Stop the introduction of ore from abroad—I make no allusion to the exhaustion nor to the non-exhaustion of the alluvial tin deposits of the East; they have their source—and it will require no great depth of philosophy to tell what effect it will have on the immediate future of Cornwall. In reverting to the class of men which your correspondent seems to despise—the working engineers—I may tell him, and he should know, that the most eminent and renowned mechanical engineers this country has produced sprang from the lathe, in the fitting-up shop, or factory—men who applied themselves to the use of the hammer, the chisel, and the file. Allusion has already been made to Gwennap, my native parish, but in closing my letter I revert to it. Fifty years ago it was teeming with activity, life, and wealth; its mines, as before stated, and which I will hereunder enumerate, were all rich, and giving, either directly or indirectly, employment to the whole of its inhabitants, and there was no place throughout the parish in which a person could have laid his head on his pillow without being in hearing of the sound or noise of one sort or another from one or more of the mines. In naming the respective mines I will begin at Wheal Gorland (near St. Day), Wheal Jewell, Wheal Unity, Wheal Unity Wood, Treskerby, Wheal Chance, Wheal Rose, North Downs, Poldice, Bissoes Pool, and Wheal Maid, West Wheal Jewell and East Wheal Jewell, Wheal Damsel, West Wheal Damsel, and East Wheal Damsel, Consols (that is, the old Wheal Virgin and Wheal Fortune Consolidated), Curvey, Clifford, Ale and Cakes, and Poldory, together called United Mines, Wheal Squire, Tingtang, Tresavean, Penstruthal, and Wheal Baller. I know not whether I have omitted any, but here you have a list of about 26 mines within the parish, and all rich at one and the same time."

A REFRIGERATOR WAGON.—The Ashbury Railway Carriage and Iron Company (Limited), of Manchester, have just completed a novel kind of railway wagon adapted for carrying meat, game, fruit, or similar perishable commodities. The wagon when loaded is hermetically closed, except where, by an automatic arrangement, air is taken in, and after undergoing a refrigerating and drying process circulates over the whole contents of the wagon. It is then discharged through an exhaust pipe. Wagons of this description will be principally used for the large traffic in meat between Scotland, Liverpool, and London. They will enable importers to store their meat for several days should they find the markets overstocked. The arrangements for cooling and drying the air have been designed by Colonel W. D. Mann.

THE "Cranston" Rock Drill

IS DRIVING LEVELS 200 LINEAR FEET PER MONTH IN HARD QUARTZ ROCK. "EBERHARDT" TUNNEL NOW DRIVEN IN OVER 3000 LINEAR FEET WITH THESE DRILLS AND COMPRESSORS.

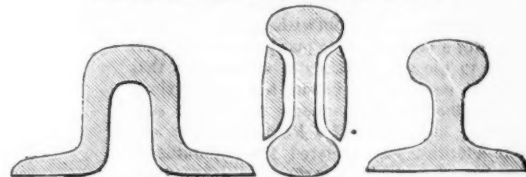


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The "SPECIAL" DIRECT-ACTING STEAM PUMP, WITH Holman's Patent Self-acting Exhaust Steam Condensers.

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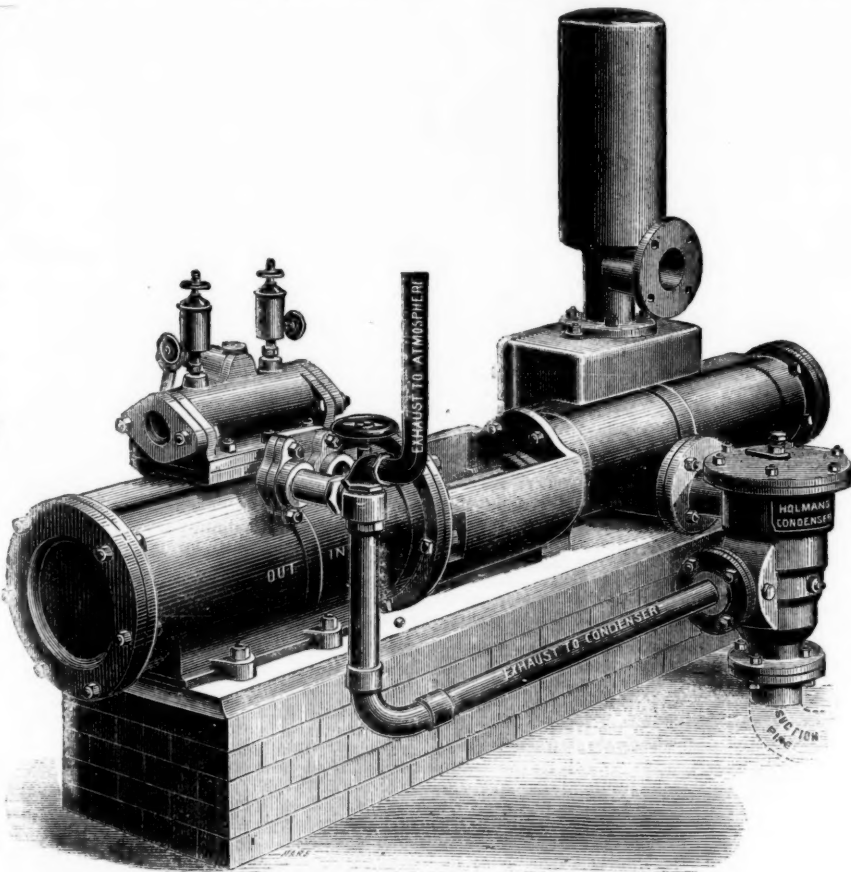
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WILLIAM ELLIOT, Esq., of the Weardale Iron and Coal Company, writes under date Sept. 17th, 1875, as follows:—"We have now THIRTY-FIVE of your SPECIAL STEAM PUMPS in operation at the various collieries under my charge—some of them employed pumping water out of our pits to the depth of 50 fms.—others employed in the pits, and a good many feeding Boilers. I have no hesitation in saying that we have found them the Cheapest and Best Pumps of the kind we have tried. I can with confidence recommend them to intending purchasers."

Messrs. BURT, BOULTON, and HAYWOOD, Chemical Manufacturers, of London, have FORTY of the "SPECIAL" STEAM PUMPS in use at their works.

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The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6
Length of StrokeIn.	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12	
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,510	5070	7330
Price of Special Pump ...£	16	18	20	25	22 10	27 10	32 10	25	30	35	40	30	35	40	45	50	40	45	50	55	65	50	55	60	70	85	55	60
Extra, if fitted with Holman's Condenser and Blow-through Valve	£7	£7	£9	£11	£8 10	£11 10s	£12 10s	£9	£12	£15	£15	£10	£13	£15	£16	£22	£13	£16	£16	£22	£22	£16	£16	£23	£24	£35	£17	£17

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18	18
Diameter of Water Cylinder..In	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14
Length of StrokeIn	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000
Price of Special Pump..£	65	75	90	100	75	80	85	110	120	140	110	120	130	140	160	180	140	150	160	180	200	180	190	210	230
Extra, if fitted with Holman's Condenser and Blow-through Valve	£23	£24	£35	£35	£20	£27	£27	£38	£38	£50	£28	£28	£40	£40	£55	£55	£28	£40	£40	£55	£55	£45	£45	£56	£60

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

The "Special" Steam Pump can be worked by Compressed Air as well as by Steam.

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36 48 and 72-inch Strokes.

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GENTLEMEN,—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the direct economic sense, a most valuable feature in the drainage of underground work.

ings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10½ lbs. per square inch, even when we run the Pump upwards of 80 strokes (106 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 84 strokes (168 feet) per minute, the steam gauge

indicating a steam pressure of 36 lbs. per square inch, 60 yards from the Pump and the Condenser vacuum gauge on the exhaust pipe indicating a steady vacuum of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The working economy thus shown is really so great that the cost of the Condenser must be saved in a very short time. (Signed) J. THOMPSON.

NORTH OF ENGLAND HOUSE
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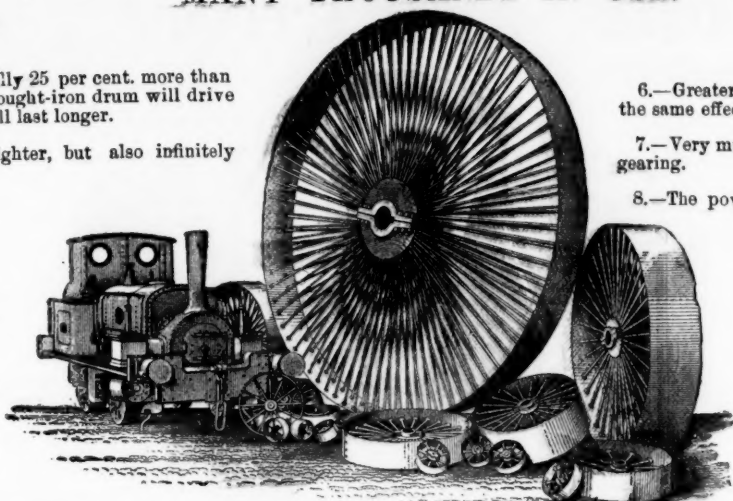
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- 5.—The wrought-iron drums and belts cost less and are more easily fixed than gearing.



ADVANTAGES.

- 6.—Greater economy in steam power, as it requires less power to transmit the same effective force with belts than it does with gearing.
- 7.—Very much greater economy in subsequent repairs as compared with gearing.
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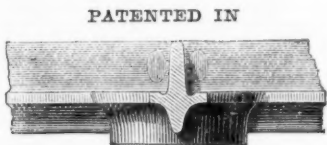
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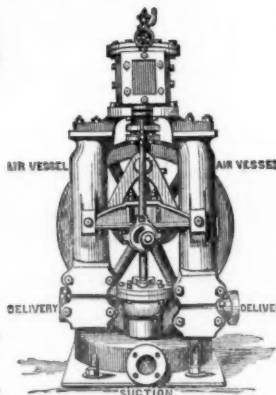
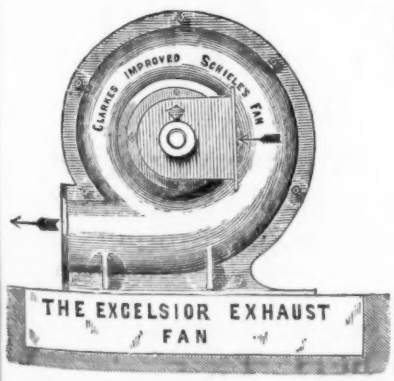
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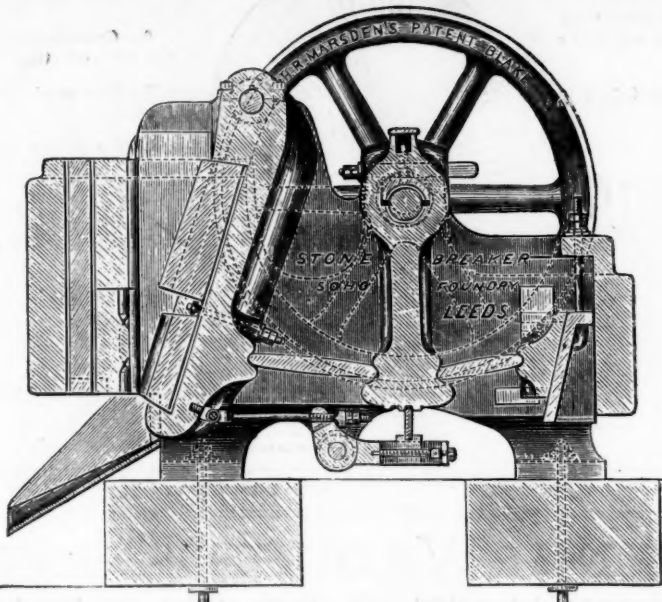
H. R. MARSDEN, PATENTEE AND ONLY MAKER BLAKE MACHINES, OF THE WELL-KNOWN ORE GRUSHERS AND STONE BREAKERS,

WITH THE
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CRUSHING OR CUBING
JAWS,

WHICH ARE CONSTRUCTED OF A PECULIAR
MIXTURE OF METAL, WEARING
Four times longer than any
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60 GOLD AND
SILVER MEDALS.

OVER 2000 NOW IN
USE.



For Crushing to any degree
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USE THESE MACHINES
EXCLUSIVELY,
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H. R. M. has long observed the want of cheaper
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And has at length, by means of improved appliances
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FIFTY per Cent., and upwards, saved by using these Machines.

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DEAR SIR,—We have adopted your Stone Breakers at many of the mines under our manage-
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tion. We are, yours faithfully,
H. R. Marsden, Esq.

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DEAR SIR,—I have broken over 40,000 tons of very hard LIMESTONE into ROAD METAL, for
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in the Show can at all compare with them. Yours, truly,
H. R. Marsden, Esq.

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TO COLLIERY AND MINE OWNERS.

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Entire new principle, saving three-quarters to 2 cwt. "dead" weight per corve. Will hold 2 to 3 cwt. more coal than the ordinary kind, without increasing the outside dimensions. Adopted by—
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In ordinary ends two machines may be worked together,
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light, and simple, easily worked, and adapted for ends and
stopes, and the sinking of winzes and shafts.

The company are also prepared to SUPPLY COMPRESSORS,
and all necessary appliances for working the said Drills.
Apply to—

LOAM AND SON,
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